BC DC

AKEDA® USER MANUAL

The jig accompanying this user manual is manufactured specifically for North America. It incorporates the imperial system of measurement. Warranty coverage, service, support, accessories and spare parts are available only in North America.

Metric jigs, accessories and spare parts are only available outside North America, and are not compatible with this jig.

If you believe you may have purchased a metric jig in North America, check the guide fingers. North American guide fingers have two tongues that engage the index strip. If your guide fingers have four tongues, contact AKEDA immediately.

USER MANUAL
BC/DC Version 1.3

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Contents

INTRODUCTION

This section explains how and why the jig works. It walks you through all the features and explains how all the parts are integrated. Once you understand the basic principles behind the design of the jig, you will find it much easier to use it.

1 How Your Jig Works

1.1 Preparing Your Jig 1
1.2 How The Clamping Systems Work 3
1.3 How Guide Fingers And Guide Rails Work 5
1.4 How Dust Collection Works 7
1.5 How Router Bit Guidance Works 9
1.6 How The Five Dovetail Cutters Work 11

2 Preparing To Use Your Jig

2.1 How To Make A Basic Drawer 13
2.2 Safety Procedures 17

CUTTING JOINTS

This section provides you with an easy step by step process for cutting through and half blind dovetails. Follow the instructions carefully, and you'll find out how easy it is to cut professional looking dovetails.

3 How To Make Through Dovetails

3.1 Through Dovetails – Overview 19
3.2 Through Dovetails – Step By Step 20

4 How To Make Half Blind Dovetails

4.1 Half Blind Dovetails – Overview 23
4.2 Half Blind Dovetails – Step By Step 24

ADVANCED

Once you achieve success with basic through and half blind dovetails, you can improve the quality, range and style of your joints. You will get much more out of the jig by following the useful pointers in this section.

5 What Can Go Wrong

5.1 Symptoms, Causes and Remedies 27
5.2 Dovetail Fit 31

6 How to Get More Out Of Your Jig

6.1 Advanced Joinery 33
6.2 Advanced Tips 39
6.3 Useful Accessories 41

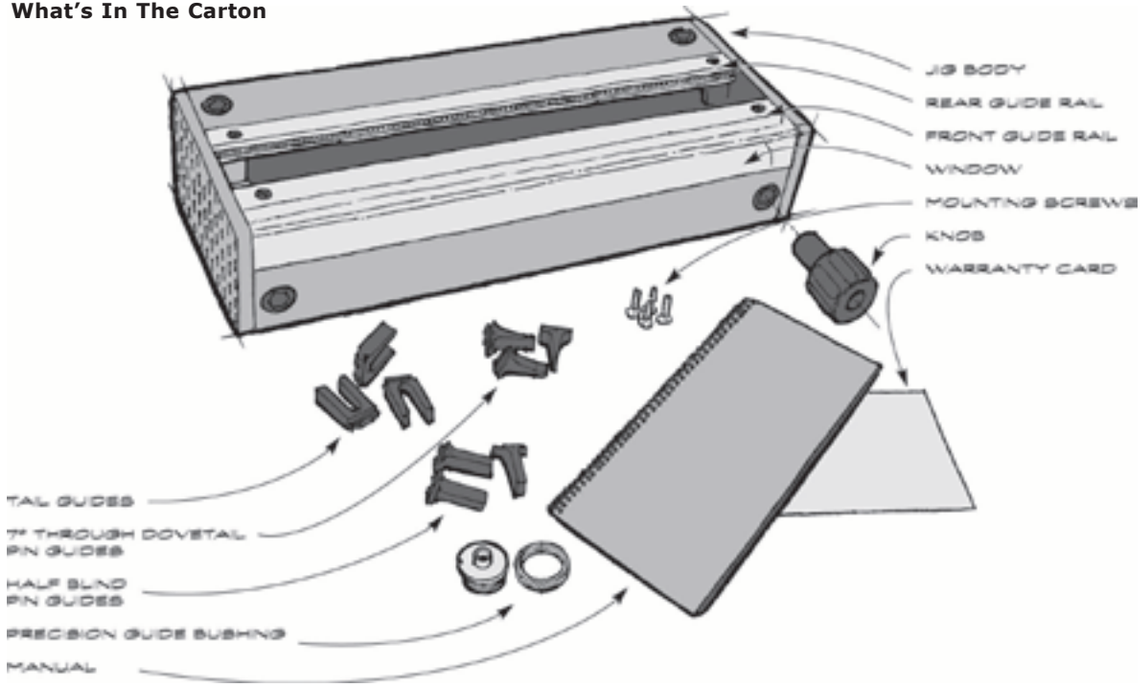
How To Use Your Manual

If you have prior dovetail jig experience you will find this jig easy and intuitive to use. Study "SAFETY PROCEDURES" (pages 17 - 18) before "CUTTING JOINTS" (pages 19 -26).

If you have little or no experience, don't worry! Follow this simple step-by-step guide and you'll quickly learn how to build a basic drawer. Once you discover how fast and easy it is to use the jig, you'll be able to create a greater variety of joints.

Look for Tips and Maintenance in the grey panels to the left. Condensed Rules are on blue panels for quick reference!

What's In The Carton



The DC16 includes 10 of each guide finger. The BC24 includes 15 of each guide finger. Your jig may also contain a pair of half blind pin stops. These are used to position half blind pin pieces (see page 43).

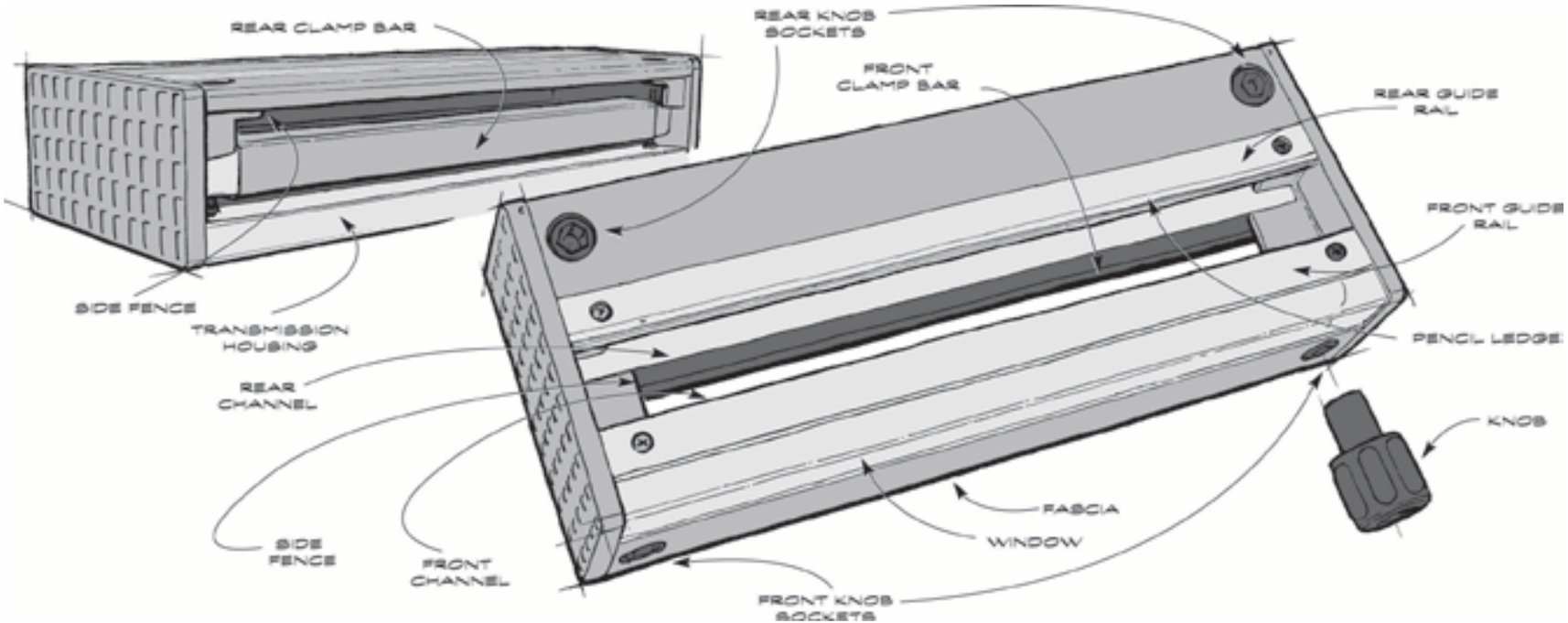
Both jigs include a front guide rail support post. Make sure it's centered in the jig. The only time you may need to slide it out of the way is when you're forming sliding dovetails.

1.1 Preparing Your Jig

Because there are so few parts to the AKEDA jig, you'll learn how to use it very quickly.

The only moving parts are the clamp bars, and since there's nothing to adjust or set up, all you really need to know is where to clamp each work piece.

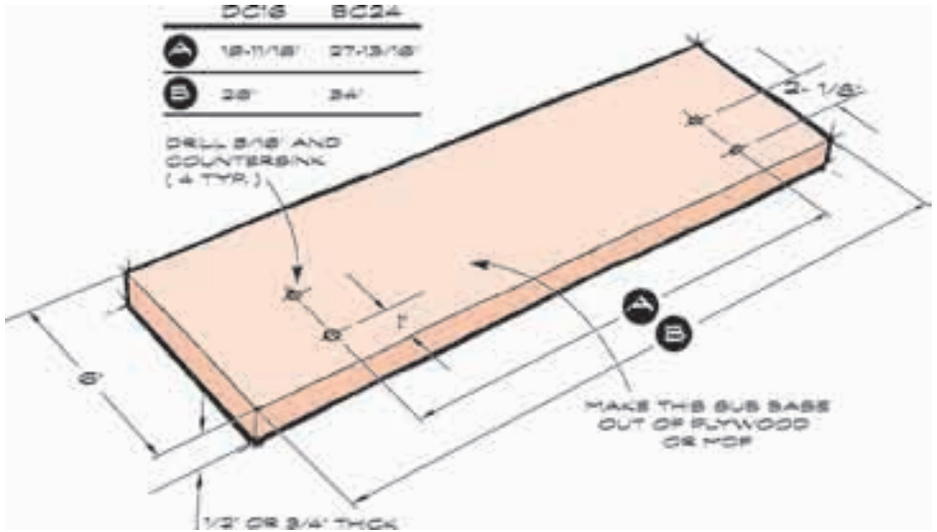
Read page 3 carefully.

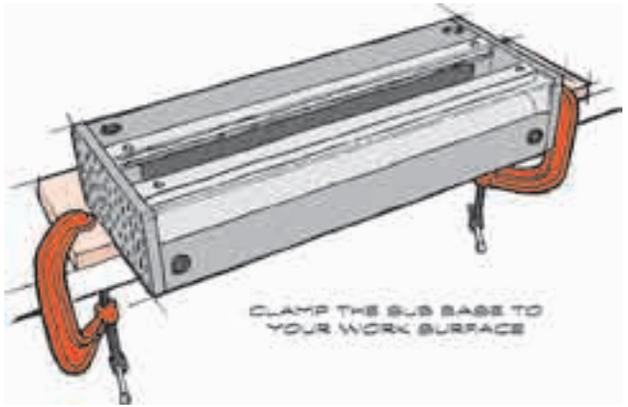


How To Mount The Jig

To make a "sub base", cut a 1/2" or 3/4" plywood board to the dimensions shown below. Attach it to the jig with the four mounting bolts supplied. Clamp the sub base down to your workbench.

Alternatively, you can mount the jig directly to your work-bench.





The jig must be firmly mounted to a solid surface.

1.2 How The Clamping System Works

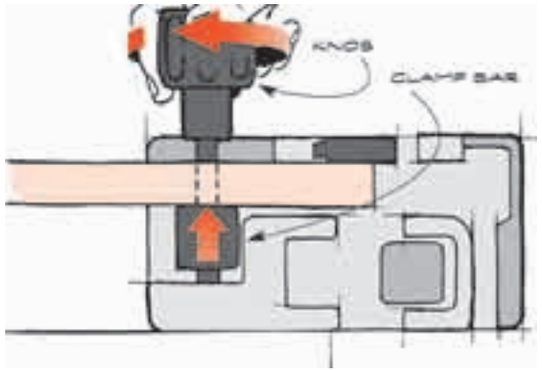
The jig has **THREE** independent parallel clamping systems:

- The **HORIZONTAL** clamp
- The **FRONT** vertical clamp
- The **REAR** vertical clamp.

Tip

Avoid over clamping. Never leave the clamping system under pressure. Never use a hex wrench in place of the clamp knob. Always remove the clamp knob before routing.

The Horizontal Clamp

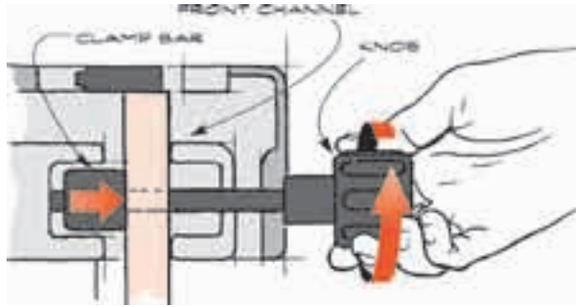


Insert the clamp knob in one of the sockets on the top of the jig to operate the horizontal clamp. Turn the knob clockwise to draw the clamp tube upwards and hold a horizontal work piece up against the underside of the top surface of the jig body.

RULE – Half Blind Dovetails

HALF BLIND PINS are clamped in the HORIZONTAL clamp

The Front Vertical Clamp

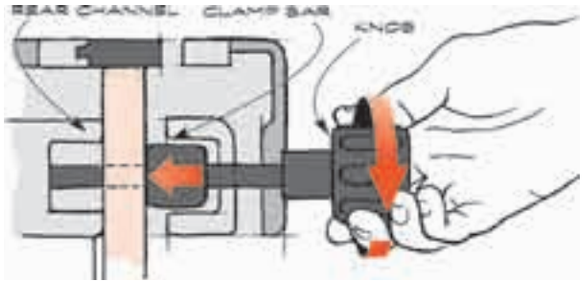


Install the clamp knob in one of the sockets on the front of the jig to operate the vertical clamp. Rotate the knob clockwise or counterclockwise to move the clamp bar forwards and backwards between, and inside the two fixed channels.

RULE – Half Blind Dovetails

HALF BLIND TAILS are clamped vertically against the FRONT CHANNEL

The Rear Vertical Clamp



By drawing the clamp tube back inside one channel, you can clamp against the opposite channel. These two channels, "FRONT" and "REAR", are the two fixed and independent vertical clamping surfaces. Each clamping surface has a specific purpose.

RULE – Through Dovetails

THROUGH DOVETAIL PINS and TAILS are clamped vertically against the REAR CHANNEL

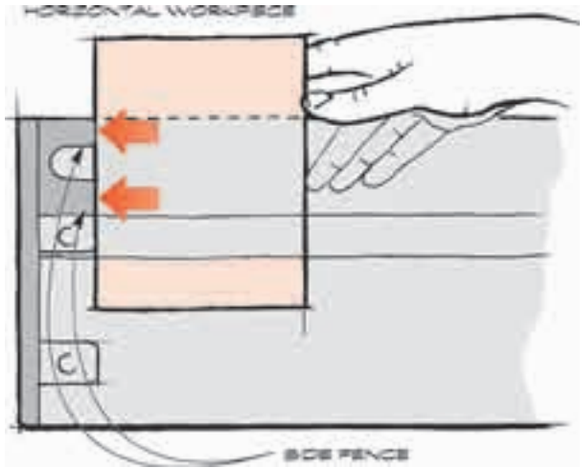
Maintenance

Wood dust may get trapped behind the vertical and horizontal clamp bars and prevent full travel. Clean out dust with compressed air or a soft brush.

Do not apply solvents or lubricants of any kind to the clamp shaft threads. The steel shafts ride on threaded brass blocks and impregnated bearings, and are therefore self-lubricating.

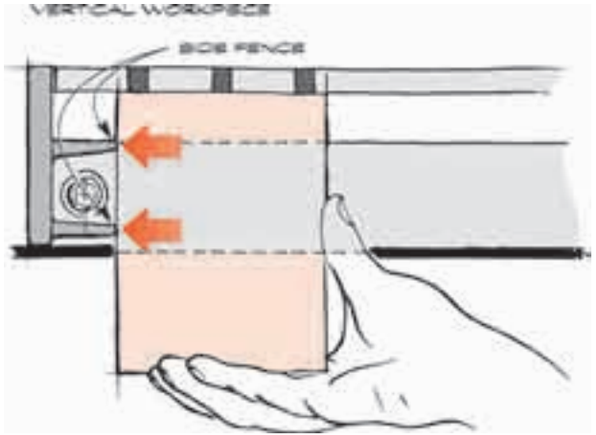
Work Piece Alignment

Always clamp a work piece with one edge tight up against the side fence, and the end firmly in contact with the underside of all the guide fingers. The work piece thickness range of both clamping systems is from 1/4" up to 1".



If a horizontally clamped work piece is not dead square across the end, it will project at an angle and cause problems with joint fit on half blind dovetails.

As a general rule, mount your work pieces at the left hand end of the jig. The exceptions include duplicate joint lay-outs, mirror image layouts, and joining work pieces of different width.



If a vertically clamped work piece is not dead square across the end, it will rock between the undersides of the guide fingers and the side fence. If you favor the fence it will cause problems with joint fit.

RULES – Alignment

Always mark your workpieces.

The exposed faces are normally called the "Face Sides", and the exposed edges are normally called the "Face Edges".

The face edge of a workpiece must always reference against a side fence.

The mating halves of any single joint are ALWAYS formed at the same end of the jig.

Through Dovetails

The Face Sides of the pin pieces will ALWAYS face towards you in the jig. The Face Sides of the tail pieces will ALWAYS face away from you in the jig.

Half Blind Dovetails

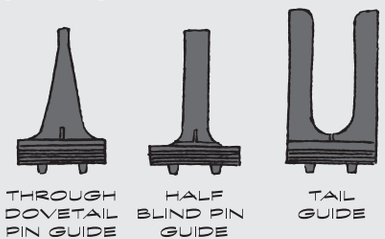
The Face Sides of the pin pieces will ALWAYS face downwards in the jig. The Face Sides of the tail pieces will ALWAYS face away from you in the jig.

If you follow the above rules, you'll find it will force you to use both ends of the jig. This is the correct way to form joints.

1.3 How Guide Fingers And Guide Rails Work

The guide fingers and guide rails provide precision guide surfaces for the guide bushing to follow, allowing the cutter to form the joint elements.

There are three basic types of guide fingers:



The long parallel extensions on the angled pin guides are not guide surfaces. They are there to provide uniform leverage for installation and removal.

Guide Finger Orientation

Install guide fingers from above (SNAP DOWN) if you want to move the guide fingers around above a work piece.

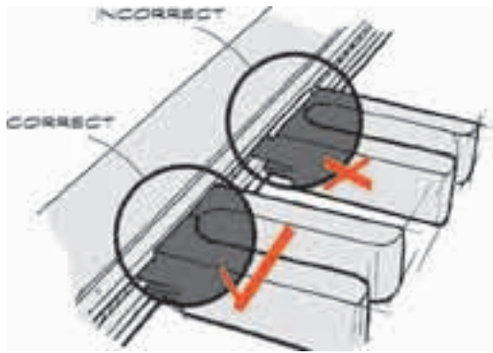
Install guide fingers from below (SNAP UP) to provide resistance to the impact from installing a work piece.

Installing Guide Fingers

Before installing a guide finger, make sure the guide finger and the guide rail are clean and free of waste. Hold the guide finger at a 30º angle, hook it under the guide rail, lower it part way down, and slide it gently sideways until you feel it engage a slot. Continue downwards until it snaps into place horizontally. Always mark guide finger positions with a pencil mark on the guide rail.

The first time guide fingers are installed, you will feel more resistance than at subsequent times. This is because the tongues on the guide fingers shave down to size the first time they are installed.

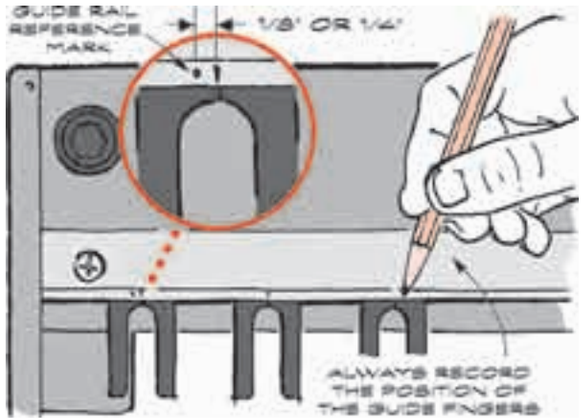
Do not force the engagement – it will damage the index strip.



The Guide Rail

Guide fingers are installed on the rear guide rail, over the work piece. The guide rail is indexed in 1/8” increments. Cut your work pieces in 1/8” width increments, and lay out the pin spacing to your own taste. The indexed guide rail makes your layouts fully and accurately repeatable.

The reference marks at each end of the guide rail indicate the position of the side fence (also the edge of your work piece). As a general rule, position the first guide finger one increment (1/8”) in from this mark to form a “half pin” with sufficient strength and balanced appearance.

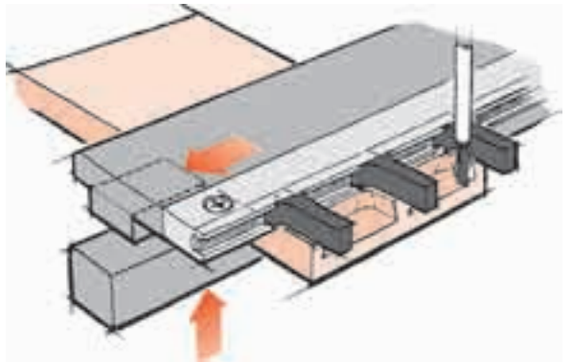


Maintenance

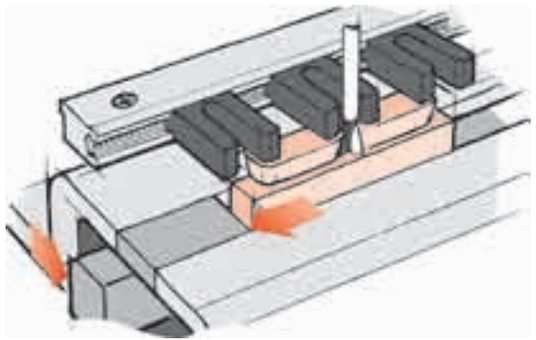
Clean out wood dust in the guide rail with a brush, compressed air, or by blowing it out. Remove hardened resin with alcohol.

Remove resin build up from the guide fingers by washing in hot soapy water and a soft cloth. Do not use solvents of any kind.

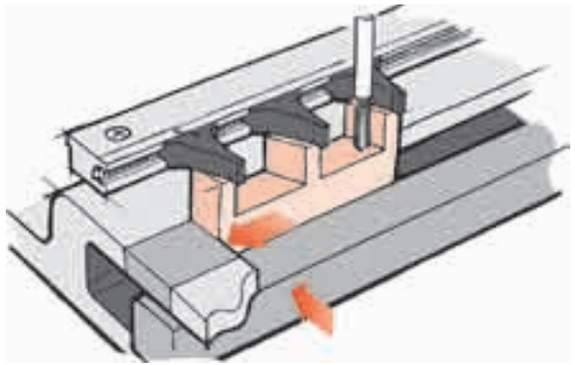
Half Blind Dovetail Pins



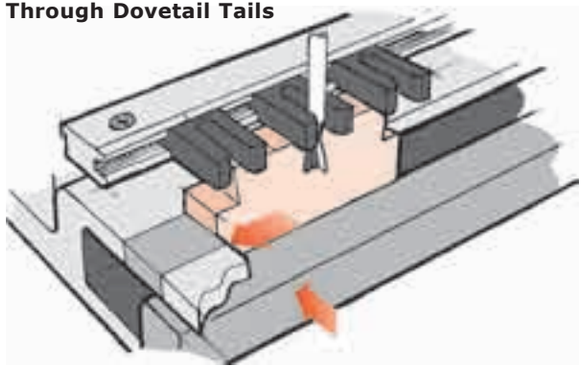
Half Blind Dovetail Tails



Through Dovetail Pins



Through Dovetail Tails



Exercise caution with the snaps on the undersides of the guide fingers – flexing them by hand may cause permanent damage.

RULES – Half Blind Dovetails

1. Use STRAIGHT SIDED PIN GUIDES to cut PIN PIECES with a DOVETAIL CUTTER.
2. Use FORK SHAPED TAIL GUIDES to cut TAIL PIECES with a DOVETAIL CUTTER.

RULES - Through Dovetails

1. Use ANGLED PIN GUIDES to cut PIN PIECES with the STRAIGHT CUTTER. The choice of PIN GUIDE ANGLE is dictated by the THICKNESS of the pin piece
2. Use FORK SHAPED TAIL GUIDES to cut TAIL PIECES with a DOVETAIL CUTTER.

1.4 How Dust Collection Works

The dust collection system will keep most of the chips and dust away from your shop and your lungs. Fine airborne dust particles are implicated in the development of allergies in some people.

Maintenance

To remove resin build up from the Lexan window, wash it carefully with plenty of hot soapy water and a soft cloth. Abrasive cleaners will scratch Lexan. Alcohol is the only acceptable solvent, and use it only to remove hardened resin.

Tip

If dust tends to stick to the window, try using an anti-static spray.

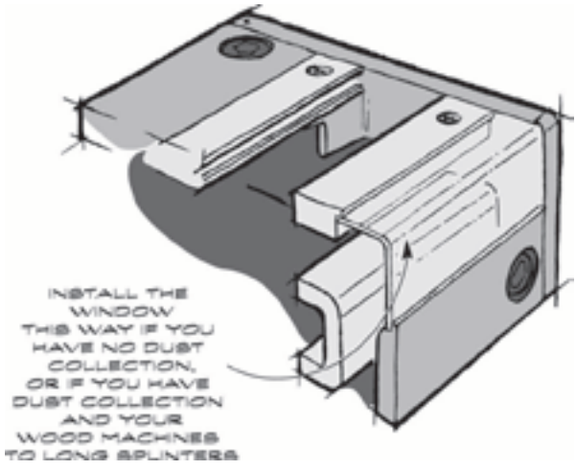
Orienting The Window

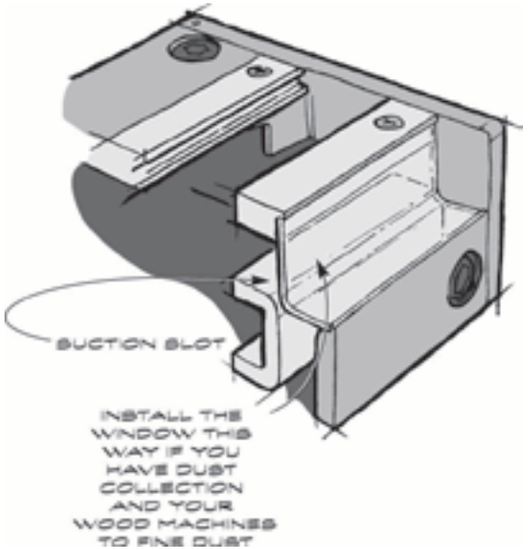
To remove the window, press down on the top surface of the window, at the same time drawing it towards you, until it snaps out from under the upper lip. Peel off and recycle the protective films.

If you don't have a shop vacuum system, reinstall the window (lower lip first) the way it was shipped, with the "V" towards you. In this position it deflects wood dust downwards through the open jig plenum, away from your face and clothing.

If you have a shop vacuum system, rotate the window 180º on its long axis, and reinstall it with the "V" towards the jig to form a long narrow suction slot along the length of the jig for wide work pieces.

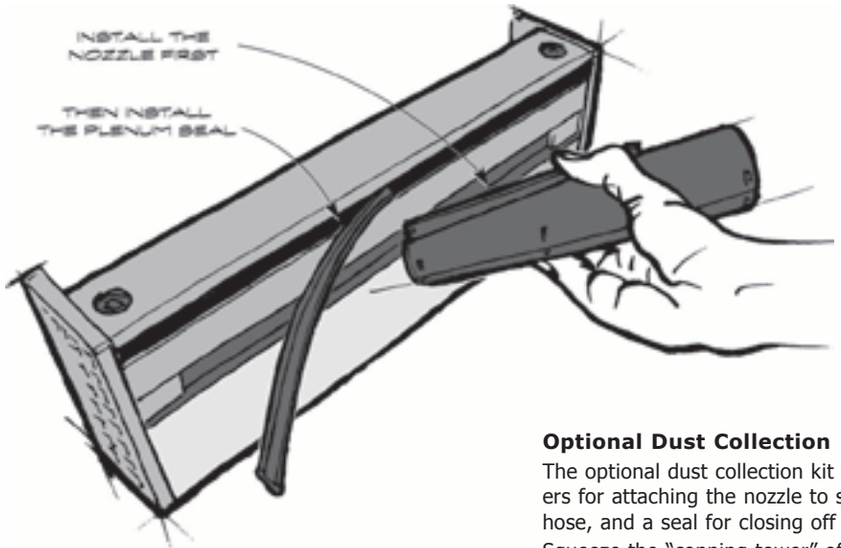
Under certain conditions, large cuttings or chips may plug the slot. If this happens frequently, try reversing the window.





Tip

If you are routing work pieces less than 8-10" wide at the same end of the jig as the nozzle, try positioning the window with the "V" towards you. The suction at the unused end of the jig will then drop to zero. The reduced resistance may improve dust collection efficiency by increasing the air flow at the active end of the jig.



Optional Dust Collection

The optional dust collection kit includes a nozzle, adapters for attaching the nozzle to standard 2-1/2" and 1-1/2" hose, and a seal for closing off the jig plenum.

Squeeze the "conning tower" of the nozzle, and insert it into the channel below the front of the jig. Slide it to any convenient position.

With a sharp knife, cut one or two lengths of plenum seal to close off the open sections left in the channel. Push the seal all the way into one slot, and then tuck it into the opposite slot.

1.5 How Router Bit Guidance Works

The AKEDA system of integrated geometry eliminates the need to adjust the jig.

Since through dovetails require precision guidance, you must always use an AKEDA precision guide bushing and AKEDA cutters.

Router Bits

AKEDA's 8mm shaft carbide cutters are Teflon® coated and the dovetail cutters are also spiral down-cut.

The AKEDA cutter dimensions are not exactly as stated. The given dimensions are the closest whole number equivalent.

After market cutters will not work with the jig. Always use AKEDA cutters.

Guide Bushings

Always use the guide bushing supplied by AKEDA. It attaches to the base of your router and makes contact with the jig's guide surfaces (the guide fingers, rear guide rail and front guide rail) to allow the cutter to form the joint elements.

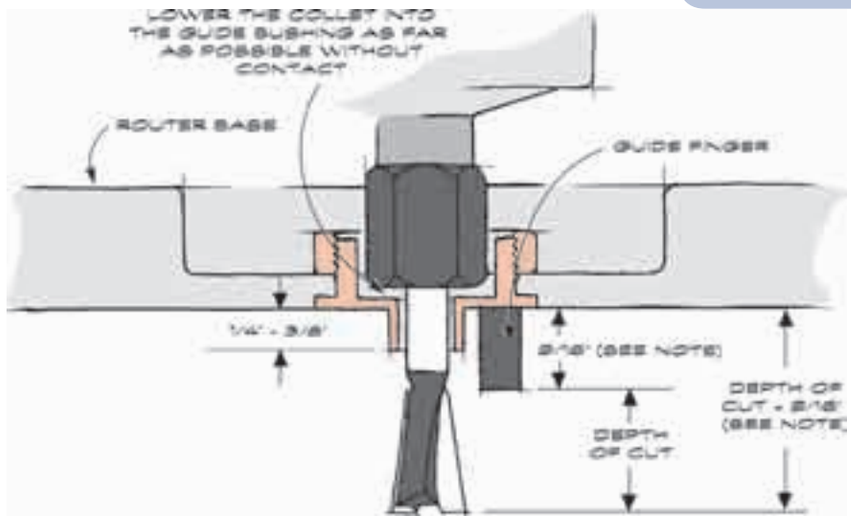
The jig will only work with a 7/16" guide bushing. If AKEDA's guide bushing does not fit your router, purchase a good quality router sub base that will accept AKEDA's "Porter Cable" style guide bushing. Check your guide bushing for sharp edges or burrs. They will damage the guide fingers. Remove sharp edges with a fine file or abrasive cloth.

The guide bushing must project from your router base a minimum of 1/4" and a maximum of 3/8". If your guide bushing is too long, you must cut it shorter. Fit a dowel inside the guide bushing and use a fine tooth hacksaw to cut it to length. Then remove the burr.

The 7/16" guide bushing supplied by AKEDA will cut accurate joints. However, there are unavoidable manufacturing tolerances in guide bushings, cutters and the jig, which can affect the fit of through dovetail joints. If you need to make a fine adjustment to through dovetail joint fit, try .004" oversize or .004" undersize guide bushings. They are available from your AKEDA dealer, individually and in the appropriate kits.

RULES – Through Dovetails

1. If your joint is too tight use an undersize guide bushing to remove more material.
2. If your joint is too loose use an oversize guide bushing to remove less material.



Note: Ribbed guide rails are 9/16" thick. Plain guide rails on older model jigs are 1/2" thick.

NEVER MIX AND MATCH GUIDE RAILS.

Maintenance

If wood waste is allowed to accumulate between the guide bushing and the cutter shaft, heat will be generated.

Unplug your router and remove the waste carefully, taking care not to damage the guide bushing.

Check the cutter for free running every time you use the jig. Also check for excessive heat after use, as it may indicate a dull cutter.

Tip

Try waxing the guide rails for smoother routing.

Checking Your Router

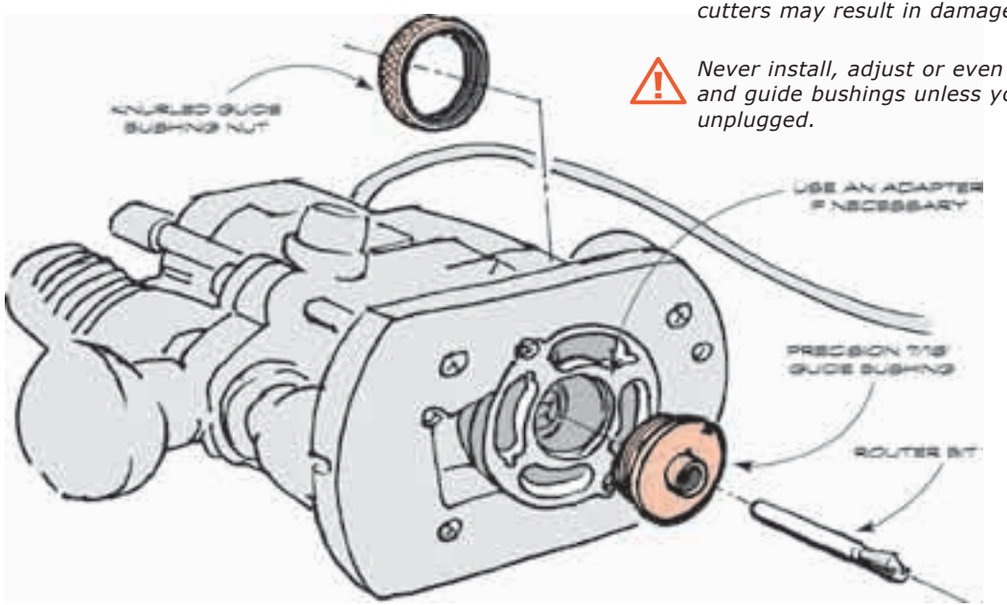
The router base always rests on the guide rails. It never touches the guide fingers.

You will need a router with a minimum 1 h.p., a minimum 6” dia. base and a 2” collet. You will also need a 1/2" to 8mm collet reducer for AKEDA's 8mm shank cutters.

To check your router, install a 7/16” guide bushing. Rest the router on the jig and make sure it does not rock due to a warped router base. Then, with the guide bushing in contact with the front guide rail, rotate the router to make sure it does not drop onto the pencil ledge on the rear guide rail, or fall between the guide rails.

If the router rocks on the guide rails, or if your router does not span the jig mouth, you will need to install a good quality 6” dia. after-market sub base, or use a router with a larger diameter, flat base.

Some routers with a single “D” base (or double “D” base as shown in the illustration) will not work with this jig if the base does not span the guide rails.



AKEDA does not recommend or support the use of bearing guided cutters. Bearing guided cutters may result in damage to the jig.

Never install, adjust or even inspect cutters and guide bushings unless your router is unplugged.

1.6 How The Five Dovetail Cutters Work

The dovetail cutters, guide fingers and the non-adjustable jig are all geometrically related.

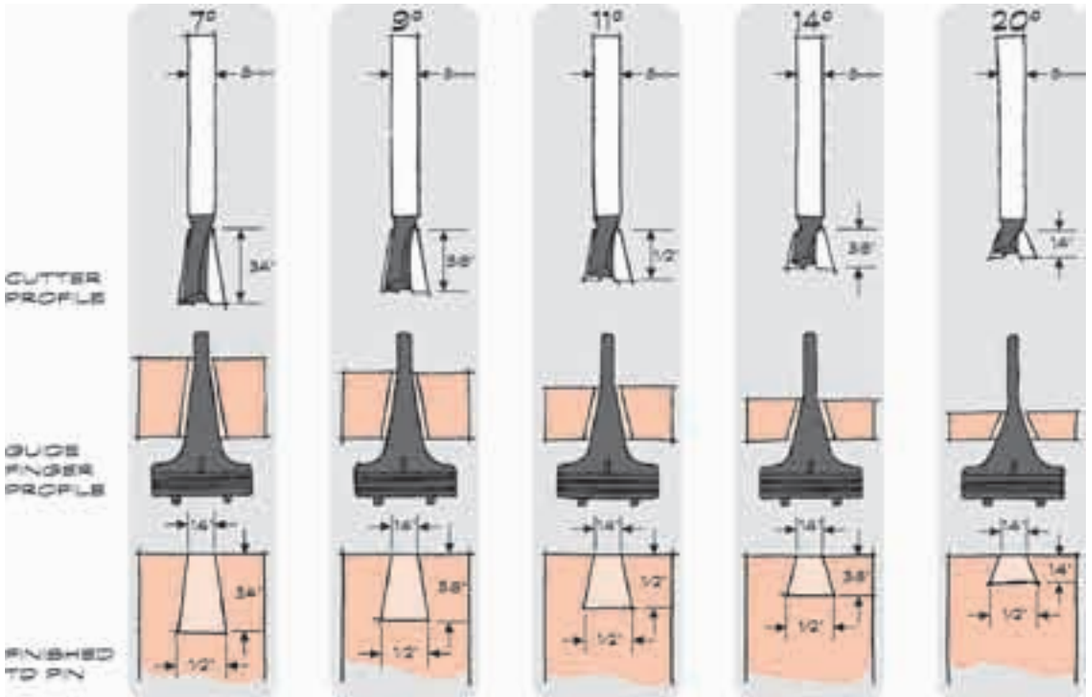
The five AKEDA dovetail cutters range in depth from 1/4" to 3/4" in 1/8" increments, with corresponding angles ranging from approximately 20º down to 7º. These cutters all share the same base diameter and the same neck diameter, and the angles of the through dovetail pin guides are matched to the angles of the cutters.

The base diameter of all AKEDA dovetail bits is .445". Standard 1/2" dovetail bits will not work with the AKEDA jig.

Through Dovetails

The range of five cutters can be used to create five different through dovetail pin profiles with depths ranging from 1/4" up to 3/4" in convenient 1/8" increments.

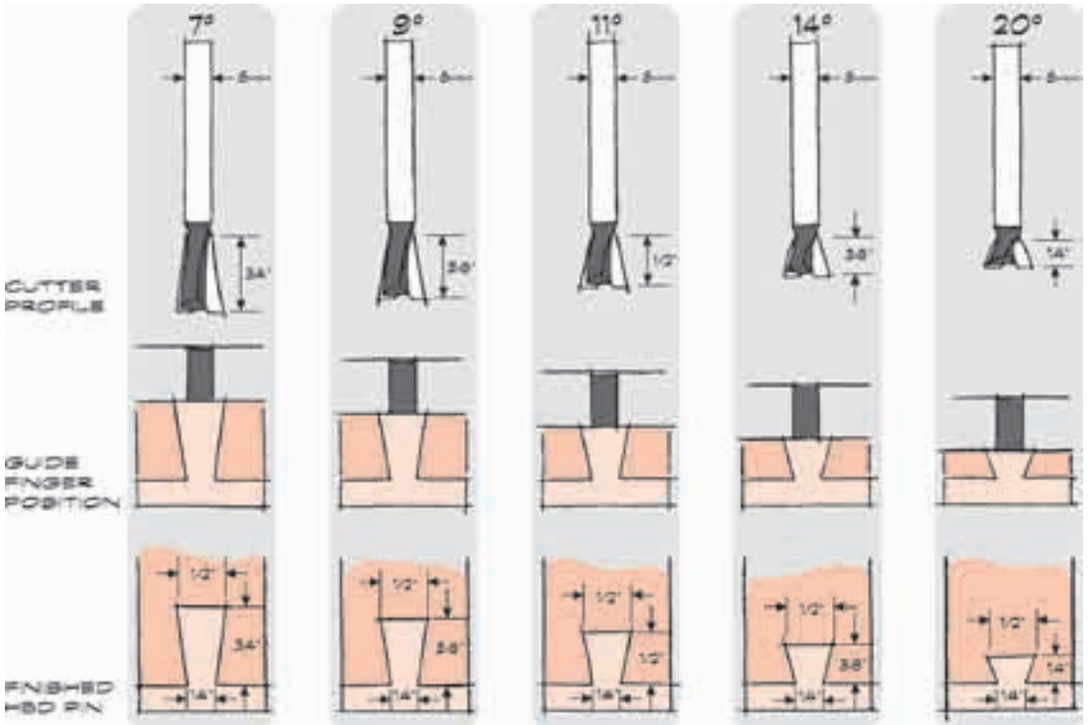
This means that all through dovetail pin pieces can be mounted in the same fixed position in the jig (the rear channel). It also means the jig does not require any adjustment for dovetail size or work piece thickness.



Half Blind Dovetails

The range of five cutters is used to create five half blind dovetail pin and tail depths ranging from 1/4" up to 3/4" in convenient 1/8" increments.

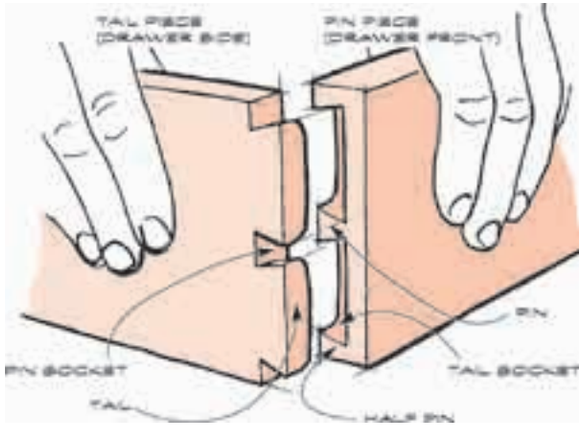
This also means that all half blind dovetail tail pieces can be mounted in the same fixed position in the jig (the front channel). It also means the jig does not require any adjustment for dovetail size or work piece thickness.



2.1 How To Make A Basic Drawer

The exercise in this manual takes you through the process of constructing a basic drawer. Two types of dovetails are used in this drawer, half blind dovetails, and through dovetails.

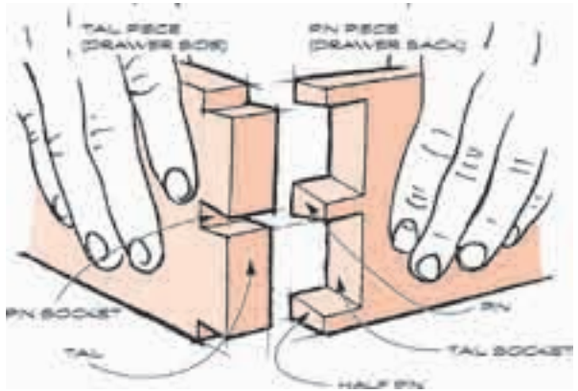
Half Blind Dovetail



RULE – Half Blind Dovetails

1. HALF BLIND DOVETAIL PINS and TAILS are cut with a dovetail cutter.

Through Dovetail



RULES – Through Dovetails

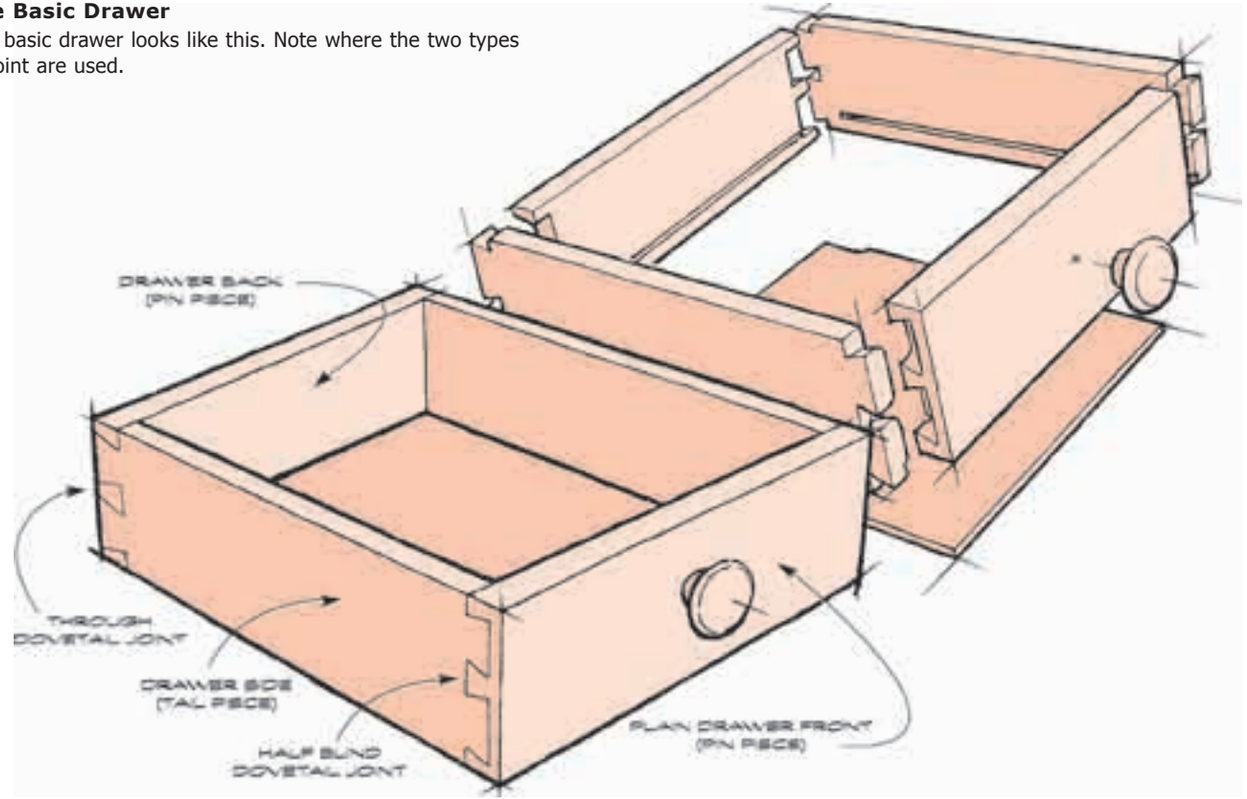
1. THROUGH DOVETAIL PINS are cut with a straight cutter.
2. THROUGH DOVETAIL TAILS are cut with a dovetail cutter.

Tip

Rabbeted drawer fronts are used to conceal the gap between the drawer and the carcass. For more information on rabbeted drawer fronts see page 33.

The Basic Drawer

The basic drawer looks like this. Note where the two types of joint are used.



RULE – Half Blind Dovetails

Use HALF BLIND DOVETAILS to join the DRAWER FRONT to the drawer SIDES.

RULE – Through Dovetails

Use THROUGH DOVETAILS to join the DRAWER SIDES to the DRAWER BACK.

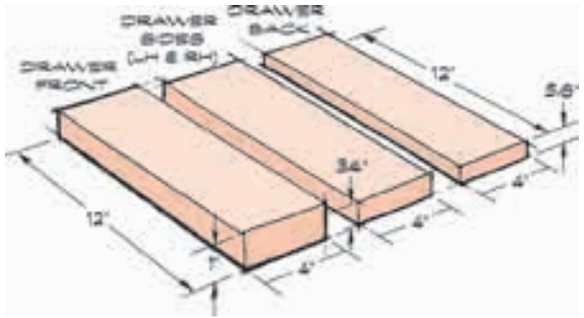
2.1 How To Make A Basic Drawer *(Continued)*

You Will Need

- A 7º dovetail cutter
- A straight cutter
- An AKEDA precision guide bushing
- 3 7º through dovetail pin guides
- 3 half blind pin guides
- 3 tail guides

Preparing The Work Pieces

Prepare several softwood work pieces to the following dimensions:

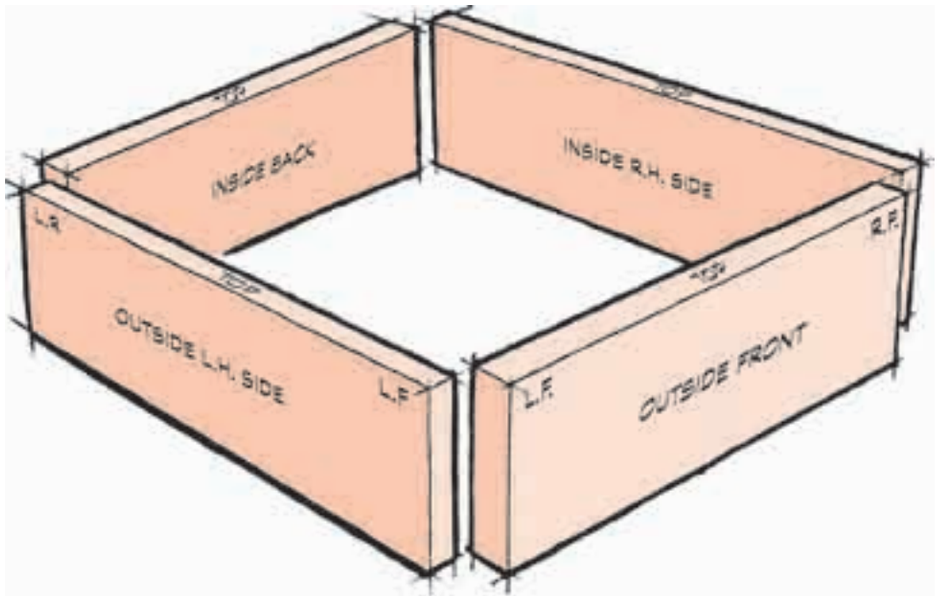


- Drawer fronts 1" x 4" x 12" long
- Drawer sides 3/4" x 4" x 12" long
- Drawer backs 5/8" x 4" x 12" long

Work pieces must be dead square on the ends, flat in all directions (not warped), and even thickness across the board. Make all the dimensions exactly as specified.

Marking The Work Pieces

Cut the work pieces to size and lay them out the way they will assemble into a drawer. Mark the insides, the outsides, the front, sides and rear, the tops, the bottoms, and the lefts and rights.

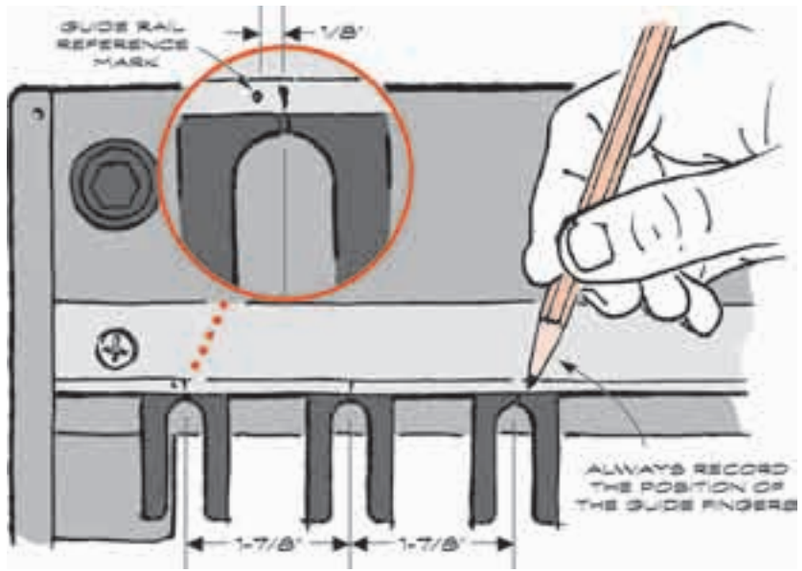


Laying Out The Joint

When you cut the joints for the basic drawer, install all the guide fingers in the positions shown below. Make sure the first guide finger is installed 1/8" away from the reference mark on the guide rail. The second guide finger is installed 1-7/8" away from the first guide finger, not the reference mark. The third guide finger is installed 1-7/8" away from the second guide finger.

Record the guide finger positions on the guide rail with a pencil.

Now study the following SAFETY PROCEDURES before proceeding to cut the joints.



2.2 Safety Procedures

The jig has five key safety features:

1. Plastic guide fingers are safer if accidentally struck by the cutter
2. The guide rails provide full support for the router base
3. The routing takes place in an enclosed cavity
4. The dust stream is directed away from the operator
5. The window provides protection from a shattered router bit

Prepare Thoroughly

- Become fully conversant with your router manufacturer's manual
- Study this manual carefully and become familiar with the jig
- Never operate a router if you're tired, or after taking drugs or medication
- Keep your shop at a comfortable temperature so your hands are not cold
- Keep children and others away from you when routing
- Remove or restrain any loose clothing or jewelry
- Always wear protection for your ears, eyes, nose and mouth

Always Check

- The work piece is mounted firmly in the jig
- The cutter is tight in the collet
- The guide bushing is secure in the router base
- The collet is not touching the guide bushing
- The jig is free of obstructions
- The viewing window is in place

ROUTER SAFETY!

KEEP THE ROUTER UNPLUGGED UNTIL YOU'RE READY TO START ROUTING!

UNPLUG THE ROUTER IMMEDIATELY AFTER ROUTING!

NEVER CHECK OR CHANGE CUTTERS OR GUIDE BUSHINGS WHEN THE ROUTER IS PLUGGED IN!

Tip

Use the Power Cord Wand (available in the DC Accessory Kit) to help keep the router's power cord out of your way while you're routing (pictured right).

The Routing Process

MAKE SURE THE ROUTER IS UNPLUGGED

- Make sure the collet is up close to, but not touching the guide bushing, and tightened securely
- Make sure the guide bushing is secure in the router base
- Make sure the cutter rotates freely
- Park the router at the left hand end of the jig
- Make sure the cutter does not contact the jig or the work piece
- Make sure the router power cord won't interfere with routing
- If you're using the power cord wand, make sure you've left enough slack cord
- Make sure the router switch is on the OFF position

PLUG IN THE ROUTER

- Adopt a stable stance in front of the jig and make sure you have good balance
- Grip the router firmly with both hands

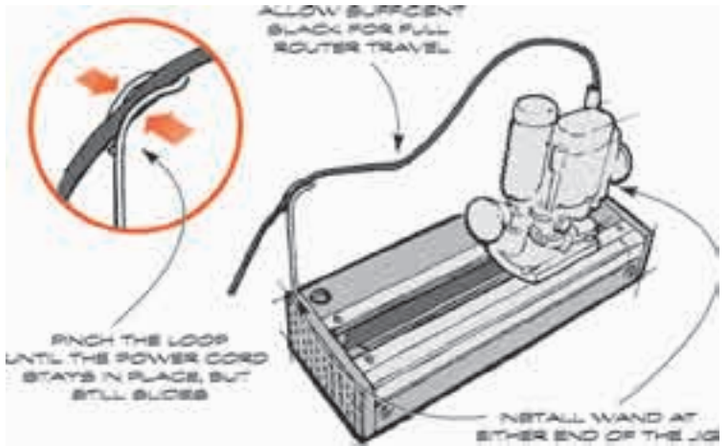
NOW SWITCH THE ROUTER ON

- Keep both hands on your router at all times
- Start routing from left to right, never allowing the router to lift off the guide rails
- Keep away from the guide fingers and guide rails at first
- Make roughing cuts from left to right, going a little deeper with each pass
- To make finishing cuts reduce the feed rate and press gently against the guide surfaces
- "Park" the router on the guide rails, away from the work piece

SWITCH THE ROUTER OFF

- Keep both hands on the router, and keep the router in contact with the jig until the motor has stopped.
- Lift the router off the jig and lay it on its side

UNPLUG THE ROUTER

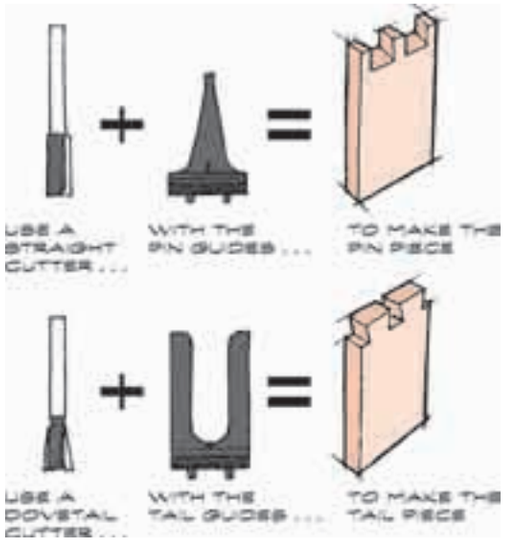


4.1 Through Dovetails Overview

You Will Need

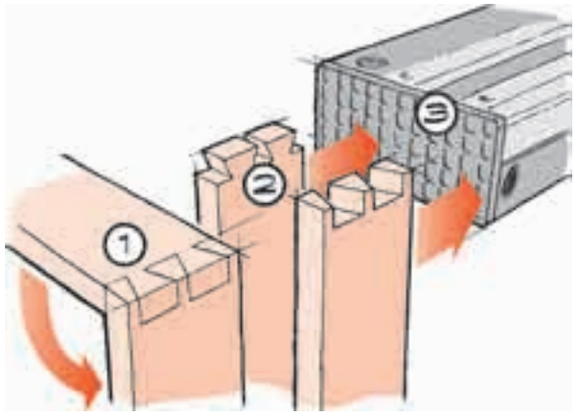
1. Angled pin guides
2. Tail guides
3. One dovetail cutter
4. One straight cutter
5. An AKEDA precision guide bushing
6. Test pieces (optional)
7. A pencil to mark the positions of the guide fingers

Cutters and Guide Fingers



Work Piece Orientation

Through dovetail work pieces must be correctly oriented for clamping in the jig. Imagine the joint is assembled in this position (1) relative to the jig. Swing the tail piece down 90º (2). This shows you the correct way to orient each work piece in the jig (3). For clarity, the work pieces are shown with cut joints. Note, both work pieces are clamped against the rear channel.



RULES – Through Dovetails

1. One dovetail cutter and one straight cutter are required.
2. Minimum pin piece (drawer back) thickness is 1/4”, and maximum thickness is 3/4”. Use the angled pin guides to cut the tail sockets that form the pins. Set the straight cutter depth to the thickness of the mating tailpiece, plus 9/16” for the thickness of the guide rails, plus a little extra for subsequent clean up.
3. Minimum tail piece (drawer side) thickness is 1/4”, and maximum thickness is 1”. Use the fork-shaped tail guides to cut the pin sockets that form the tails. Set the dovetail cutter depth to the thickness of the mating pin piece, plus 9/16” for the thickness of the guide rails, plus a little extra for subsequent clean up.
4. Use an oversize or undersize guide bushing to make a fine adjustment to joint fit.
5. Raise or lower cutters to adjust joint flushness.

4.2 Through Dovetails Step By Step

Tip

Choose the "Best" cutter if possible. For example, although the 3/4", 5/8", 1/2" and 3/8" dovetail cutters could all be used to cut 3/8" deep pin sockets, the 3/8" cutter, unlike the others, will create a pin socket that's 1/4" wide at it's narrowest point. This 3/8" cutter will create a more slender and elegant pin profile than the others, and will make a stronger joint.

Tip

To set the cutter depth, clamp the mating work piece in the horizontal clamp and use it as a gauge to set the cutter depth.

STEP 1 - SELECT A DOVETAIL CUTTER

Pin Piece Thickness	Dovetail Cutters 3/4" x 7º	5/8" x 9º	1/2 x 11º	3/8" x 14º	1/4" x 20º
1/4" min	OK	OK	OK	OK	Select
3/8"	OK	OK	OK	Best	
1/2"	OK	OK	Best		
5/8"	OK	Best			
3/4" max.	Best				

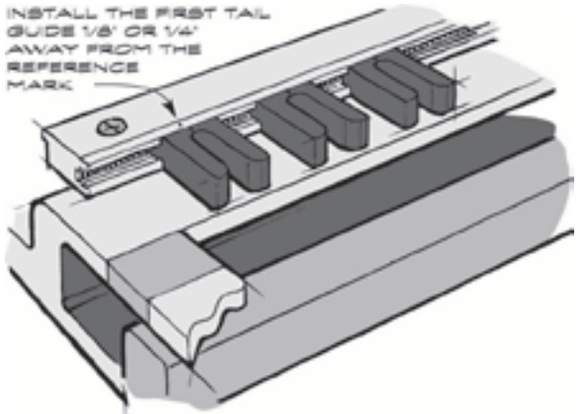
Five dovetail angles are possible, from 7º up to 20º in convenient 1/8" cutter depth increments. For best results, select the shortest possible cutter, i.e., the cutter whose length is equal to, or slightly greater than the thickness of the pin piece. For example, select the 1/2" (11º) cutter if the pin piece is 7/16" thick.

Adjust the cutter depth until it projects from the router base by a distance equal to the thickness of the mating pin piece, plus 9/16" for the thickness of the guide rails, plus a little extra for subsequent clean up.

Although through dovetails will likely require no adjustment for fit, you may want to cut a test joint the first time.

If you're building the sample drawer, select the 3/4" cutter and set it to 1-3/16" depth, plus 1/64" for subsequent clean up.

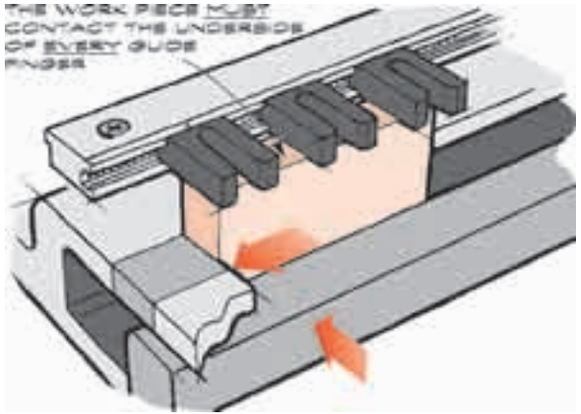
STEP 2 - INSTALL THE TAIL GUIDES



Install a row of tail guides on the guide rail.

If you're building the sample drawer, refer to page 16 for the tail guide spacing.

STEP 3 - CLAMP THE TAIL PIECE (drawer side)



Clamp the tail piece:

- Against the rear channel.
- The outside surface of the tail piece facing away from you.
- Firmly up against the side fence at the left hand end of the jig.
- Firmly up against the undersides of all the tail guides.

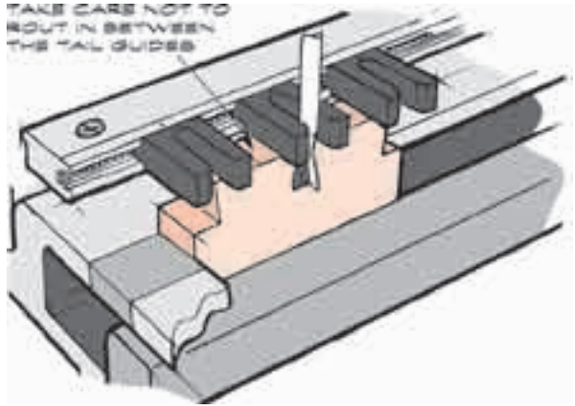
If you're building the sample drawer, make sure the first tail guide is 1/8" away from the reference mark.

4.2 Through Dovetails Step By Step *(Continued)*

Tip

If the sockets splinter at the back (tear out) see "How To Reduce Tear Out" on page 40.

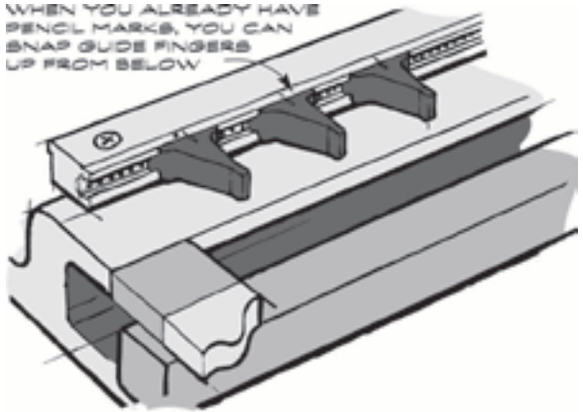
STEP 4 - FORM THE TAIL PIECE



Using the dovetail cutter and working from left to right, rout in between the forks, using gentle pressure against the guide fingers. Reduce the feed rate when breaking through the back of the sockets. Take care not to rout in between the individual tail guides. You can also install tail guide spacers.

Use a pencil to mark the positions of the tail guides on the guide rail. Remove the tail guides and the tailpiece.

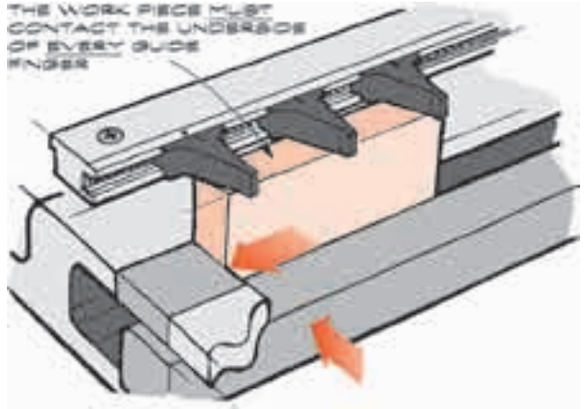
STEP 5 - INSTALL THE TD PIN GUIDES



Install the angled pin guides in line with the pencil marks.

If you're building the sample drawer, use the 7º pin guides to match the 7º cutter.

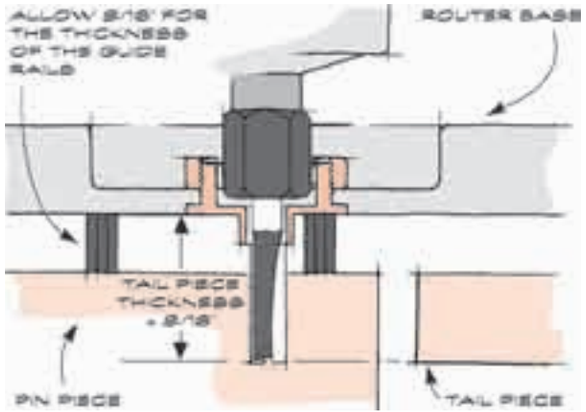
STEP 6 - CLAMP THE PIN PIECE (drawer back)



Clamp the pin piece:

- Against the rear channel.
- The outside surface of the drawer back facing towards you.
- Firmly up against the side fence at the left hand end of the jig.
- Firmly up against the undersides of all the guide fingers.

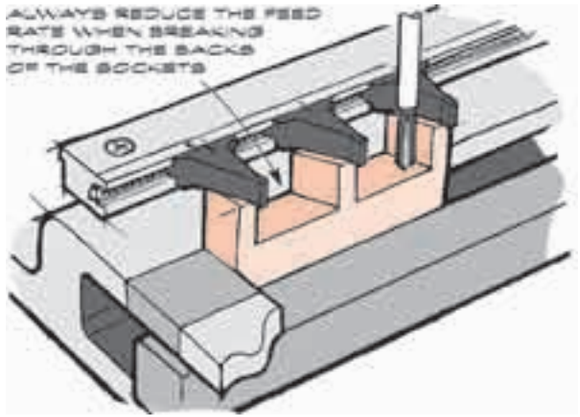
STEP 7 - INSTALL THE STRAIGHT CUTTER



Adjust the straight cutter depth until it projects from the router base by a distance equal to the thickness of the tail piece, plus 9/16" for the thickness of the guide rails, plus a little extra for subsequent clean up.

If you're building the sample drawer, set the straight cutter to 1-5/16" depth, plus a little extra for subsequent clean up.

STEP 8 - FORM THE PIN PIECE



Working from left to right, take roughing cuts to remove most of the waste, then rout along the sides of the pin guides, using gentle pressure. Reduce the feed rate when breaking through the back of the sockets.

Remove the pin piece and try fitting it to the tail piece. Refer to the rules on the right.

If you're having problems other than fit, refer to the troubleshooting section on the following pages.

RULES- Adjusting Joint Fit

Through dovetail joints will not normally require adjustment for fit. However, fine adjustment may be necessary due to a build up of tolerances in the jig, guide fingers, guide bushings and cutters; differences in fit between softwoods and hardwoods; and variations in machined surface finish.

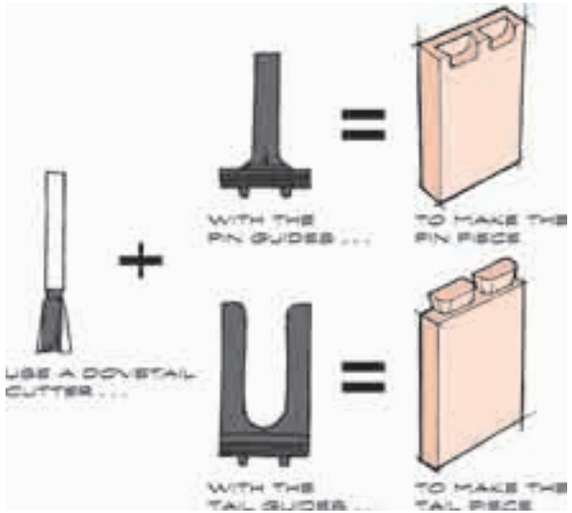
- If the joint is too tight, use an undersize guide bushing. Carefully remount the pin pieces and remove more material.
- If the joint is too loose, use an oversize guide bushing to remove less material, and cut new pin pieces.
- If the pins are too proud, plane or sand them off after gluing, and next time decrease the straight cutter depth. Or, if necessary, cut a new pin piece. If the pins are below flush, increase the cutter depth, carefully remount the pin piece and cut deeper tail sockets.
- If the tails are too proud, plane or sand them off after gluing, and next time decrease the dovetail cutter depth. Or, if necessary, cut a new tail piece. If the tails are below flush, increase the cutter depth to form deeper pin sockets, and cut a new tail piece.

3.1 Half Blind Dovetails Overview

You Will Need

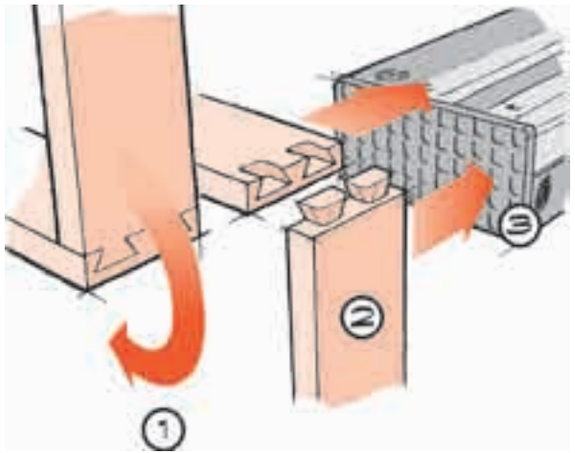
1. Half blind pin guides
2. Tail guides
3. One dovetail cutter
4. An AKEDA precision guide bushing
5. Test pieces
6. A pencil to mark the positions of the guide fingers

Cutters and Guide Fingers



Work Piece Orientation

Half blind dovetail work pieces must be correctly oriented for clamping in the jig. Imagine the joint is assembled in this position (1) relative to the jig. Swing the tail piece out 180º (2). This shows you the correct way to orient each work piece in the jig (3). For clarity, the work pieces are shown with cut joints.



RULES – Half Blind Dovetails

1. Half blind dovetail pins and tails are both cut with the same dovetail cutter. A straight cutter is not required.
2. Minimum pin piece (drawer front) thickness is 3/8”, and maximum thickness is 1”. Use the parallel-sided pin guides to cut the tail sockets that form the pins.
3. Minimum tailpiece (drawer side) thickness is 1/4”, and maximum thickness is 1”. Use the fork-shaped tail guides to cut the pin sockets that form the tails.
4. The five dovetail cutters make possible five pin/tail depths from 1/4” up to 3/4”, in convenient 1/8” cutter depth increments. Select a cutter by its depth. Dovetail cutter angle is incidental.
5. Set the cutter depth to its full incremental length, plus 1/2” allowance for the thickness of the guide fingers. Keep the same cutter depth setting for pins and tails.
6. Control the joint fit by making fine adjustments to the cutter depth.

3.2 Half Blind Dovetails Step By Step

STEP 1 – SELECT THE DOVETAIL CUTTER

Select a dovetail cutter length that's at least 1/8" less than the thickness of the drawer front. If your drawer front features a rabbet, select a cutter that will miss the rabbet.

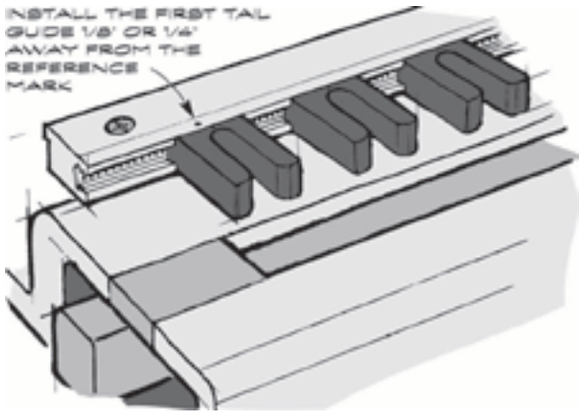
Drawer front thickness range	**Suggested cutter** (depth x angle)	**Set the cutter to this depth**
1" max.	3/4" x 7º	1-5/16"
3/4 - 1"	5/8" x 9º	1-3/16"
5/8 - 7/8"	1/2" x 11º	1-1/16"
1/2 - 3/4"	3/8" x 14º	15/16"
3/8 min. - 5/8"	1/4" x 20º	13/16"

Set the cutter to the depth indicated in the right hand column. The cutter depth setting includes 9/16" for the thickness of the guide rails.

Cut a test joint first and adjust the cutter up or down to find the correct cutter depth setting. Note, the steeper the cutter angle, the more sensitive it is to cutter depth adjustments.

If you're building the sample drawer, select the 3/4" cutter and set it to 1-5/16" depth.

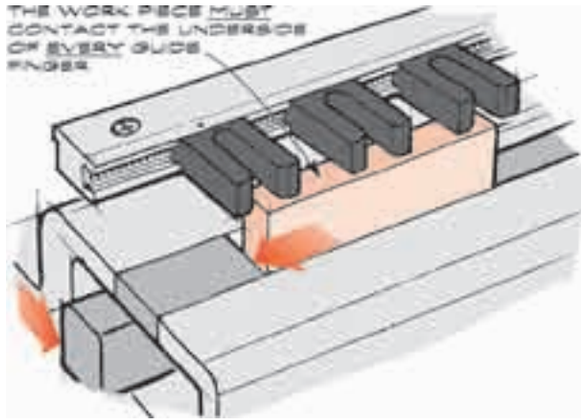
STEP 2 – INSTALL THE TAIL GUIDES



Install a row of tail guides on the guide rail.

If you're building the sample drawer, refer to page 16 for the tail guide spacing.

STEP 3 – CLAMP THE TAIL PIECE (drawer side)



Clamp the tail piece:

- Against the front channel.
- The outside surface of the drawer facing away from you.
- Firmly up against the side fence at the left hand end of the jig.
- Firmly up against the undersides of all the guide fingers.

If you're building the sample drawer, make sure the first tail guide is 1/8" away from the reference mark.

3.2 Half Blind Dovetails Step By Step *(Continued)*

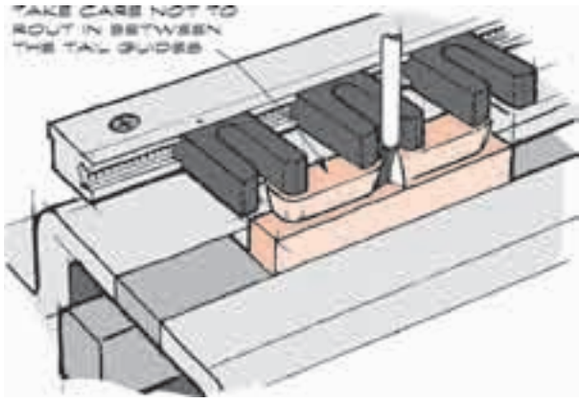
Tip

If the sockets splinter at the back (tear out) see "How To Reduce Tear Out" on page 40.

Tip

Use a pair of Half Blind Pin Stops (available in the 64-piece C-KIT) to automatically locate your pin piece in the correct position every time. Simply install them in place of the outer pair of pin guides and adjust them to the thickness of the mating tail piece. They work with all pin pieces, including rabbeted drawer fronts.

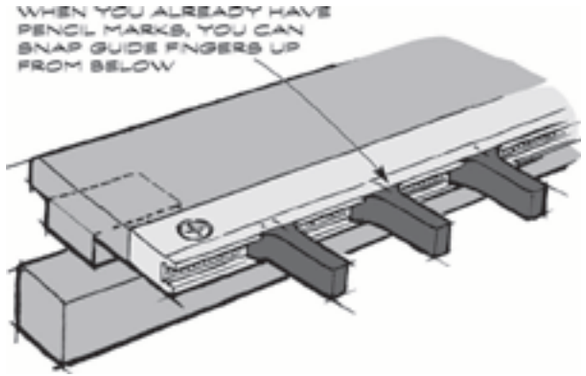
STEP 4 – FORM THE TAIL PIECE



1. Take a first cut right across the width of the tailpiece from left to right. Keep the guide bushing in contact with the front guide rail at all times.
2. Without lifting the router, return to the left hand end of the jig. Maintain contact with the front guide rail.
3. Work from left to right. Rout in between the forks. Reduce the feed rate when breaking through the backs of the sockets. Take care not to rout in between the tail guides. You can also install tail guide spacers.

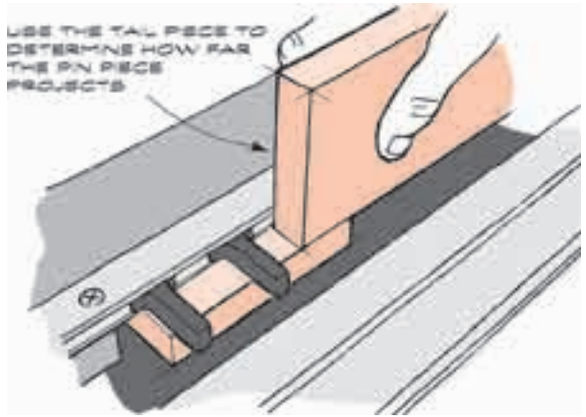
Use a pencil to mark the positions of the tail guides on the guide rail. Remove the tail guides and the tailpiece.

STEP 5 – INSTALL THE HBD PIN GUIDES



Install the pin guides in line with the pencil marks on the guide rail.

STEP 6 – CLAMP THE PIN PIECE (drawer front)



Clamp the pin piece:

- Horizontally.
- The outside surface of the drawer facing downwards.
- Firmly up against the side fence at the end of the jig.
- Projecting past the guide rail by a distance equal to the thickness of the previously cut drawer side.
- Make sure there is no gap between the pin piece and the undersides of the pin guides.

If you're building the sample drawer, the pin piece must project 3/4" past the guide rail.

Tip

Half Blind Dovetail Test Joints – Quick Method

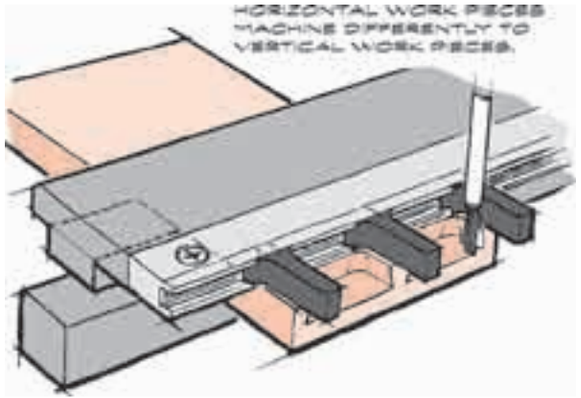
A fast method for making half blind dovetail test joints is to make end-on-end dovetails across a narrow board. See "End-On-End Dovetails", page 38.

Tip

Recording Half Blind Dovetail Cutter Depth

Once you've determined the correct cutter depth on a half blind dovetail test joint, machine a ledge along a close grained hardwood test piece mounted in the horizontal clamping system, mark it with the cutter size, and keep it for future reference. Next time, use this test piece as an accurate depth gauge.

STEP 7 – FORM THE PIN PIECE



Work from left to right. Take roughing cuts first, then rout along the sides of the pin guides and along the guide rail, using gentle pressure with the guide bushing.

Remove the pin piece and try fitting it to the tail piece. Refer to the rules on the right.

If you're having problems other than fit, refer to the troubleshooting section on page 27.

RULES – Adjusting Joint Fit

Adjust the cutter up or down for the correct joint fit

- If the joint is too loose, lower the cutter slightly and cut another test joint
- If the joint is too tight, raise the cutter and cut another test joint
- If the tail sockets are not deep enough, re-install the pin piece, projecting slightly further out from the guide rail, and re-machine the tail sockets

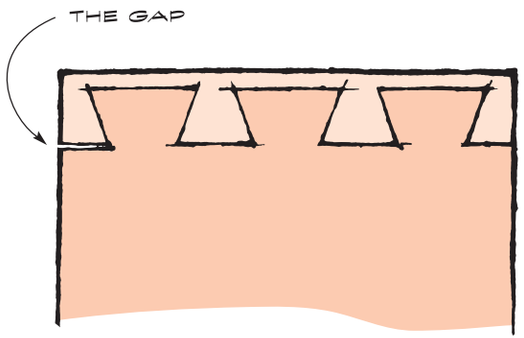
5.1 Symptoms, Causes and Remedies

Symptom	Possible Cause	Possible Remedy
Dovetails are a consistent, progressively looser (or tighter) fit across the width of the work piece Joint elements consistently and progressively project further beyond the surface across the width of the work piece	• One work piece was not parallel with the guide rail • Work piece was not contacting the undersides of all the guide fingers • Work piece slipped in the clamping system while you were routing • Dust was trapped between a work piece and a clamping surface or guide finger • A guide finger was not properly seated • The cutter was loose in the collet • Work piece was not an even thickness across the board	• Keep the jig clean and free of excessive wood dust • Make sure the work piece is tightly clamped and snug up against the guide fingers • Make sure all guide fingers are properly seated • Make sure the cutter is tight in the collet • Make sure work pieces are even thickness
One joint element is offset 1/8" or 1/4" from its corresponding socket	• Guide finger was installed in the wrong position	• Position the guide finger correctly and cut a new work piece
When assembled, one work piece is laterally offset against the other	• One or both work pieces was not square on the end • One work piece was not up against the side fence • Symmetrical tail piece is assembled backwards	• Make sure work pieces are square • Make sure work pieces are tight against the side fence • Assemble joint correctly
The half pin on the end splits away when assembling the joint	• The half pin is too narrow and therefore too weak • The joint is too tight	• Make the half pin thicker • Adjust the joint fit
The cutter "tears out" wood at the fronts, backs and sides of the sockets	• Dull router bit • Feed rate too high • Sometimes the result of normal "up-cutting". Some species of wood are more prone to tear out	• Replace the router bit • Reduce the feed rate when breaking through • See "How To Reduce Tear Out" (page 38)

Symptom	Possible Cause	Possible Remedy
The bottoms of the sockets are uneven	• A guide finger is not seated horizontally and the router base is bumping over it • The router base is not perfectly flat • The router was allowed to lift from the jig • Guide rail mounting screw is not properly seated • The cutter is lose in the collet • The work piece is loose	• Remove the guide finger. Clean dust off the guide finger and the guide rail, and replace the guide finger. If guide finger still sits high, check for damage. Replace guide finger and/or guide rail • Check the underside of the router base for flatness. Install a good quality after market router sub base • Always keep the router base in contact with the guide rails • Make sure the guide rail screws, collet and work piece are tight
The sides of the sockets are uneven	• There's a corresponding bump on a guide finger • The guide bushing was allowed to lose contact with the guide fingers	• Keep the guide fingers free of wood dust and resin. Use a jeweler's file to remove guide finger damage or injection molding flash. • Stop the router and remove it from the jig. Run your finger over the sides of sockets before removing the work piece. Re-machine if necessary.
Cutter chatters and leaves a rough finish	• Cutter is dull • Cutter is extended too far out from the collet • Feed rate is too high • Wood is very hard or very thin	• Replace the cutter • Lower the collet so it's almost touching the guide bushing. • Reduce the feed rate. • Use a vertical support board to support thin work pieces. Always mount this vertical support board in contact with a clamp tube, not a channel
Through dovetail joint is a loose fit	• Undersize guide bushing • You're not using an AKEDA cutter	• Install a precision 7/16" guide bushing • Install a larger guide bushing • Use only AKEDA cutters with a precision guide bushing. Other cutters will not work with the jig

5.1 Symptoms, Causes and Remedies *(Continued)*

Symptom	Possible Cause	Possible Remedy
Through dovetail joint is tight fit	• Oversize guide bushing • You're not using an AKEDA cutter	• Install a precision 7/16" guide bushing • Install a smaller guide bushing • Use only AKEDA cutters with a precision guide bushing. Other cutters will not work with the jig
Half blind joint is tight fit, or won't go together	• Cutter set too deep	• Decrease the cutter depth
Half blind joint is a loose fit	• Cutter not set deep enough	• Increase the cutter depth
The angle of the through dovetail pin doesn't match the angle of the socket	• The cutter angle and pin guide angle are not matched	• Match the angle of the cutter and the pin guide
There's a gap between the joint elements on one half blind work piece and the corresponding sockets	• One work piece was not tight up under the guide fingers, or the pin piece is warped and not touching the pin guides • The cutter depth was changed between cutting pins and cutting tails	• Make sure both work pieces are in contact with the under sides the guide fingers • Cut the joint without changing the cutter depth setting between pins and tails • Replace warped work pieces
The depth of cut is not close to what it should be to get a half blind joint to fit	• You're not using an AKEDA cutter • You're not using a 7/16" guide bushing	• AKEDA cutter geometry results in a predictable depth of cut. Some after market cutters may work with the jig, but depth of cut will be unpredictable

Symptom	Possible Cause	Possible Remedy
You may experience a gap under the end sockets on all types of joints. The following drawing illustrates the defect.  The problem is your router. There are three very similar possibilities. One or more of them will cause the router to drop slightly as it nears the ends of the guide rails, causing your bit to cut deeper than it should. Unplug your router and turn it upside down. The router base is likely black plastic and attached to a stiff router base casting.	Lay a straight edge across the plastic base. 1. Is the router base flat all the way across to the center hole? Is it concave? 2. Does the router base feature a shallow circular recess, say, half the diameter of the base? 3. Finally, try pressing down hard on the plastic base with your thumb. Does it flex with thumb pressure? Any one of the above will cause the router to drop slightly as it nears the ends of the guide rails. Keep the router unplugged, turn it right way up and rest it on the jig. Move it towards one end of the jig and note, as the edge of the router base starts to extend beyond the guide rails, it will drop slightly due to one of the above causes, allowing the cutter to extend deeper into your workpiece, creating an end socket that's cut too deep, and causing a gap.	Purchase a good quality router with a flat rigid base that won't bend under it's own weight, or purchase a good quality after-market router base. We recommend one that's made of rigid clear acrylic because it helps with visibility.

5.2 Dovetail Fit

Dovetail Fit

The most common problem with Through Dovetails is a loose joint.

The most common problem with Half Blind Dovetails is when you keep lowering the cutter until you run out of carbide, but the joint is still too loose.

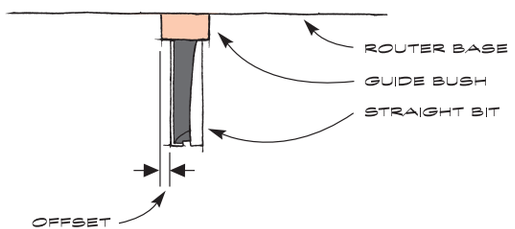
There are five possible causes:

- Your router is well used and the bearings are worn, causing the cutter to rotate eccentrically.
- The router collet is dirty. Clean it with alcohol, then apply a light coating of oil.
- The guide bushing is loose in the router base plate, allowing it to move from side to side under side pressure.
- The guide bushing is not .438" +/- .001". Always use an AKEDA guide bushing.
- The router bit is out of specification. The standard straight bit should measure .315", the box joint bit should measure .350", and the dovetail bits should measure .445". All router bits should be +/- .002".

Using O/S and U/S to Adjust Dovetail Fit

You can use .004" oversize (O/S) and .004" undersize (U/S) guide bushings to adjust joint fit.

To understand how O/S and U/S guide bushings work, look at the illustration below.



Joint fit is controlled by the "offset" between the router bit and the guide bushing. These are the basic rules:

1. A smaller diameter guide bushing will reduce the offset, causing more material to be removed. This makes a looser joint.
2. A larger diameter guide bushing will increase the offset, causing less material to be removed. This makes a tighter joint.

Note, you can use the standard, undersize or oversize guide bushings with one or both cutters to get up to +/- .008" adjustment. Use the following chart to adjust the fit of your joint.

Using O/S and U/S Guide Bushings with the Straight Bit and the Dovetail (DT) Bit

	DT Bit with U/S guide bushing	DT Bit with STD guide bushing	DT Bit with U/S guide bushing
U/S guide bushing with the straight bit	.008" Looser Fit	.004" Looser Fit	Normal Fit
STD guide bushing with the straight bit	.004" Looser Fit	Normal Fit	.004" Tighter Fit
O/S guide bushing with the straight bit	Normal Fit	.004" Tighter Fit	.008" Tighter Fit

Half Blind Dovetail Fit

You can use an O/S guide bushing to reduce the depth of cut of half blind dovetails. The amount will depend on the angle of the dovetail bit you're using. Caution - Never use a U/S guide bushing to increase the depth of cut. You will run out of carbide.

Box Joint Fit

O/S and U/S guide bushings can also be used with the AKEDA box joint cutter to adjust the fit of box joints.

Checking Your Router and Guide Bushing

Half blind dovetail fit is controlled by cutter depth. Lowering the cutter on half blind dovetails will make a tighter joint. Raising the cutter will make a looser joint.

Sometimes you may find you keep lowering the cutter until you run out of carbide, but the joint is still too loose.

This problem is common to all half blind dovetail jigs, not just the AKEDA jig. Put simply, the cutter is removing too much material on the angled sides of the joint, and there are a finite number of reasons why this can happen.

Work your way methodically through all the possible causes listed below, starting with the most likely cause and ending with the least likely:

- Some 7/16" guide bushings can be as much as .020" undersize, causing too much material to be removed. Measure your guide bushing with a vernier or micrometer. If it isn't 0.438" dia. +/- .001" (11,1mm +/- 0.02), purchase an AKEDA precision guide bushing from your local dealer, or as a temporary fix wrap aluminum or Teflon tape around the guide bushing.
- The dovetail bit is chattering, causing tear out on the mating angled surfaces, with the result that too much material is being removed. Lower the collet as close to the guide bushing as possible without touching it, rough out the sockets, then take fine finishing cuts.
- Make sure your guide bushing is dead tight. A loose guide bushing that can slip sideways as little as a few thousandths of an inch will cause too much material to be removed.
- If the router bit is rotating eccentrically, it will cause too much material to be removed. With the router unplugged and upside down, check the collet for side-to-side play. Then carefully rotate the router bit by hand against a small block of hardwood held against the router base. If one of the carbide blades does not scrape the block, the cutter is eccentric. Try cleaning the collet and the cutter shaft. Also, check for a bent cutter shaft, damaged collet or worn router bearing.
- An oversize cutter is the least likely cause of too much material being removed. Carefully measure the diameter with a vernier caliper or micrometer. Take extra care not to damage the carbide edge. AKEDA (or "AKEDA Approved") cutters are 0.445" dia. +/- 0.002" (11,30mm +/- 0.05).

If All Else Fails...

If you still can't trace the cause of a poorly fitting joint, you can always compensate as follows:

Half Blind Dovetails

If you've lowered the cutter until you've run out of carbide, and the joint is still too loose, install an oversize guide bushing.

Through Dovetails and Box Joints

If your joint is too loose, use an oversize guide bushing with one or both work pieces.

See the above charts for more details.

Always use AKEDA precision guide bushings. They are marked 0.434 (undersize), 0.438 (standard) or 0.442 (oversize).

Always use AKEDA (or "AKEDA Approved") cutters.

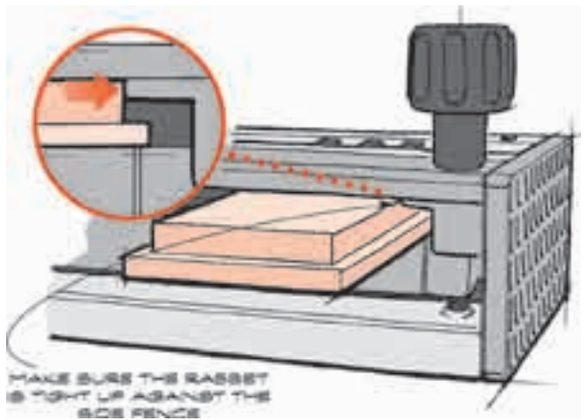
6.1 Advanced Joinery

The AKEDA jig is capable of much more than dovetails. Exercise your creativity to find new ways of putting the jig to work. The ideas on the following pages are meant to prompt you in the right direction, rather than provide you with detailed comprehensive instructions.

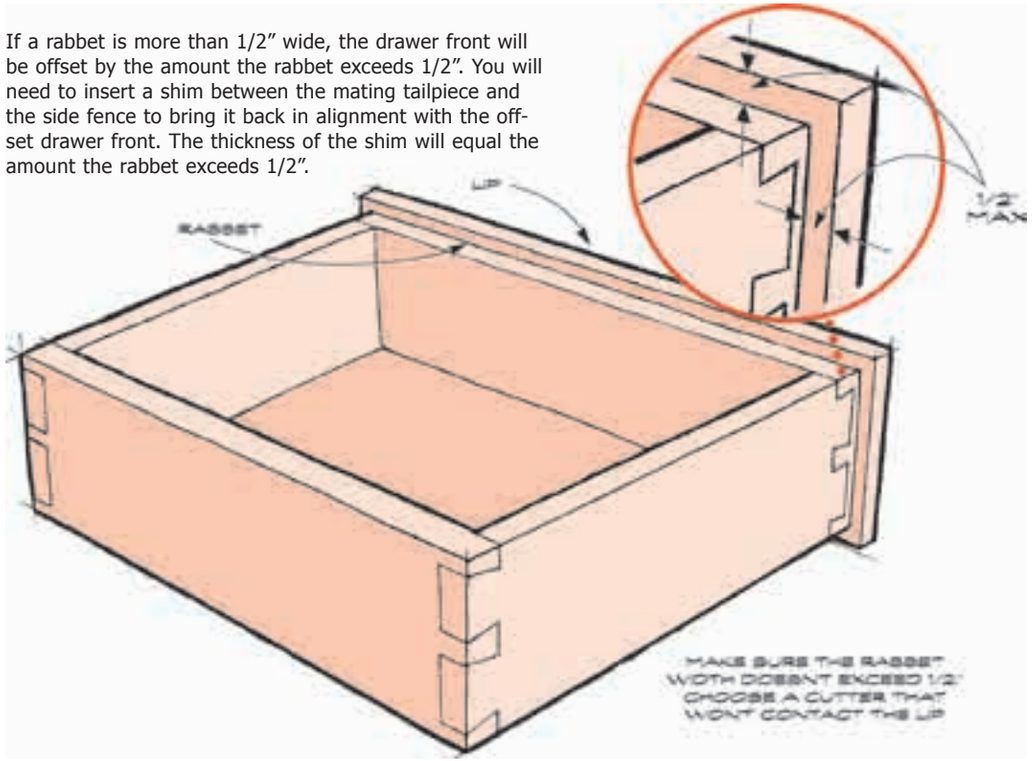
How To Cut Rabbeted Drawer Fronts

Rabbeted drawer fronts require no special set up, provided the rabbet is 1/2" wide or less, and the remaining "blind" material is a minimum 1/4" deep. Rabbet thickness is influenced by the drawer front thickness and the dovetail cutter to be used.

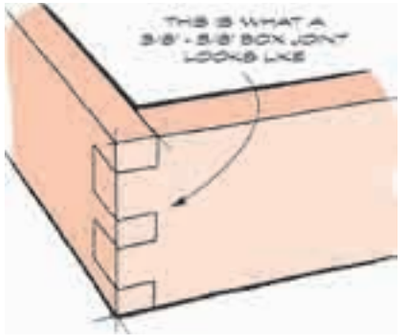
Simply install the rabbeted drawer front in the horizontal clamp, face side down, the same way you would if the drawer front had no rabbet at all. Note, it's the body of the drawer front that references against the side fence, not the rabbet.



If a rabbet is more than 1/2" wide, the drawer front will be offset by the amount the rabbet exceeds 1/2". You will need to insert a shim between the mating tailpiece and the side fence to bring it back in alignment with the offset drawer front. The thickness of the shim will equal the amount the rabbet exceeds 1/2".



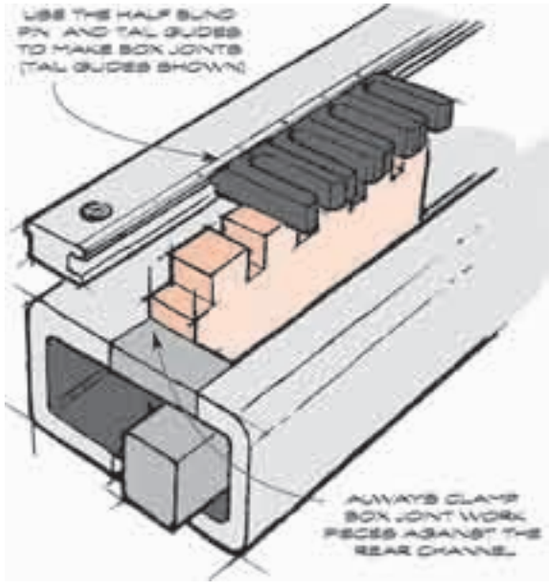
Box Joints With Variable Spacing



Box joints can be made easily using the half blind pin and tail guides. The half blind pin guides will form "pins" approx. 3/8" wide, and the corresponding "tails" will be a minimum 5/8" wide based on 1" guide finger spacing. You will need an AKEDA .350" box joint cutter. When you're cutting box joints with guide fingers, you do not need to offset one work piece.

Always clamp box joint work pieces against the rear channel.

Always use an AKEDA 7/16" precision thin wall guide bushing to provide clearance for the box joint cutter.



Adjusting the Index Strip

On some older model jigs the index strip is crimped in place. Newer models feature a kinked index strip. Both can easily be adjusted.

The index strip is preset at the factory, flush left (centered in the jig). Therefore adjusting the index strip should only be attemped by advanced users.

Why would you adjust the Index Strip?

- You want to increase or decrease the size of your half pins. Note, increasing one half pin will cause the other half pin to decrease by the same amount.
- You want to centre your guide fingers to a work piece that's not an exact 1/8" increment, and you want equal size half pins.
- You want to deliberately form uneven half pins.
- You want to realign the index strip in the center of the jig.

Directions

- Remove all guide fingers and work pieces from the jig.
- Install one tail guide at the L.H. end of the jig.
- Using a scrap piece of wood, tap the tail guide gently.

This will move the index strip. Measure between the tail guide and the end plate, and repeat the process until the guide fingers are where you want them.

6.1 Advanced Joinery *(Continued)*

Shadow Through Dovetails

Shadow dovetails are especially easy on the AKEDA jig because the incremental guide finger positioning is uniform and always fully repeatable.

They are made the same way as conventional dovetails, but in two steps, using a combination of lighter and darker wood. They're cut by offsetting the guide finger positions by, say, one increment and by using two levels of cutter depth. With some experimentation, several variations of shadow through dovetails are possible.

Draw the joint to scale on paper, then cut a test piece. The pin location must shift one 1/8" increment to the left of the base position, then one 1/8" increment to the right to make the 1/8" shadows on either side of the pin. The cutter must be lowered, say, 1/8" to make the shadow at the bottom of the socket match the shadow at the sides.

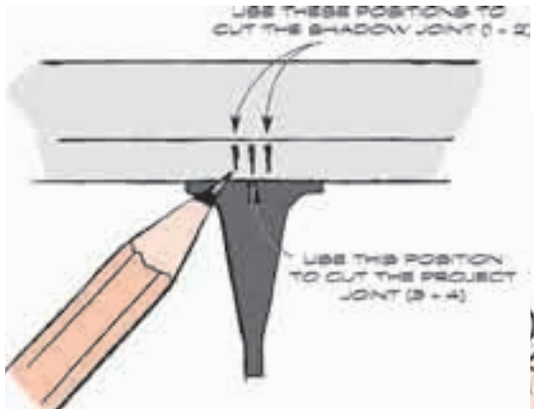
1 Start by cutting the shadow joint using a light colored project tail piece and a short "shadow pin piece" in darker wood, 1/8" thicker than your final project pin piece.

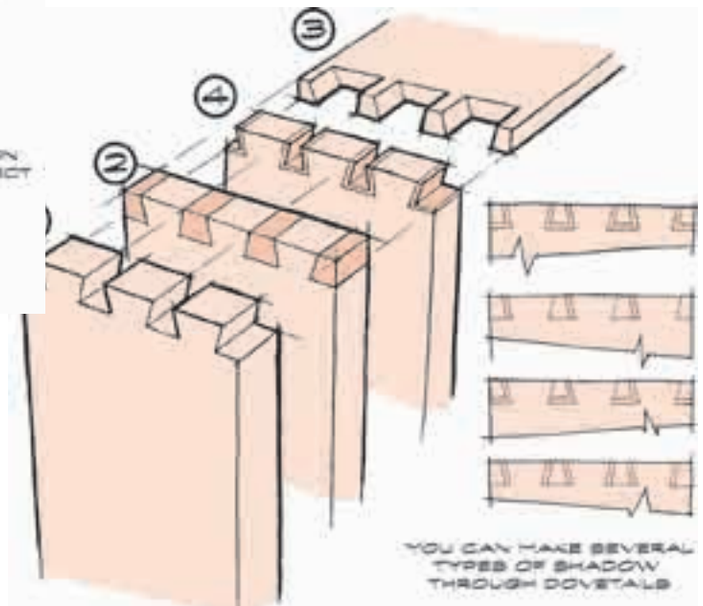
2 When the glue has set, saw off all but the pins and take the waste dark wood back down to the surface of the tailpiece.

3 Cut your actual project pin piece.

4 Cut new pin sockets in the dark wood of the tailpiece to match.

Since the maximum pin piece thickness on any joint is 3/4", and the project pin piece thickness likely 1/8" less, the maximum project pin piece must be 5/8" or less.





Sliding Dovetails

The male piece must be a minimum 1/2" thick for shouldered joints, and a minimum 5/16" thick for plain joints. As a general rule the male piece should not penetrate the mating piece by more than 1/3 the thickness of the mating piece. Cut a test joint first.

It's possible to make sliding dovetails using the front and rear guide rails as fences. However, using the optional sliding dovetail template reduces the chance of error.

Mark the joint on both work pieces. Install a couple of tail guides to act as temporary stops for the work piece. Clamp the male piece against the front channel, up against the tail guides. Remove the tail guides and install the sliding dovetail template. Using the template as a guide surface, cut one side of the male joint, routing from left to right.

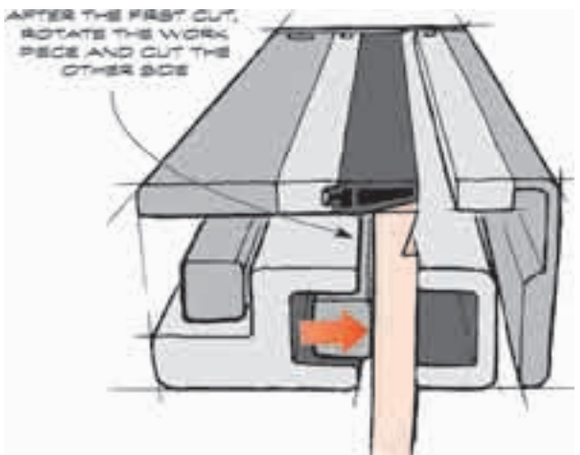
Turn the work piece around on its vertical axis, reposition it with the temporary tail guides, reinstall the template and cut the opposite side.

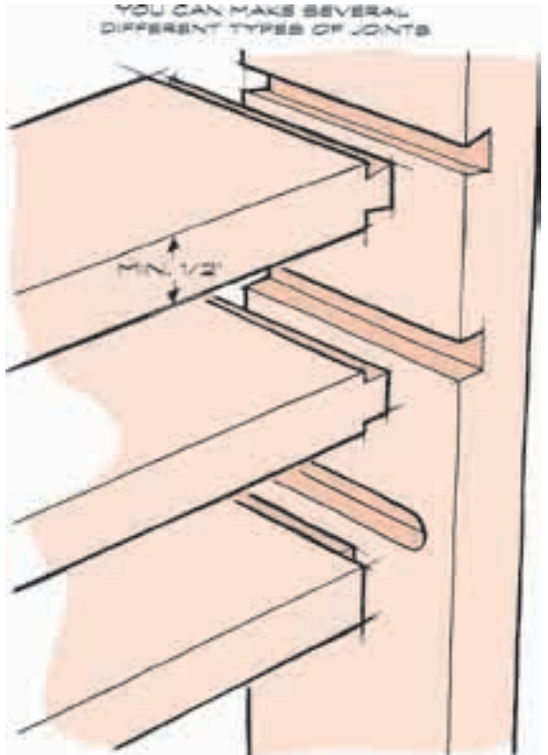
Important – always make a final pass with the guide bushing firmly in contact with the template.

Remove the window and mount the mating piece horizontally. Make the first pass from left to right using the template as a guide surface, and use the front guide rail as a guide surface on the return pass, right to left. Adjust the mating piece fore or aft by trial and error to fit the socket to the male piece.

Use dovetail cutters to make sliding dovetails, and straight cutters to make shouldered joints. With extra effort you can make stopped and tapered joints. If you make up an angled shim, you can cut angled mating pieces, for instance, sloped shelving.

Never try to guess where to install a vertically clamped work piece. Always install a pair of temporary guide fingers as a reference. They can always be removed after the work piece has been positioned.



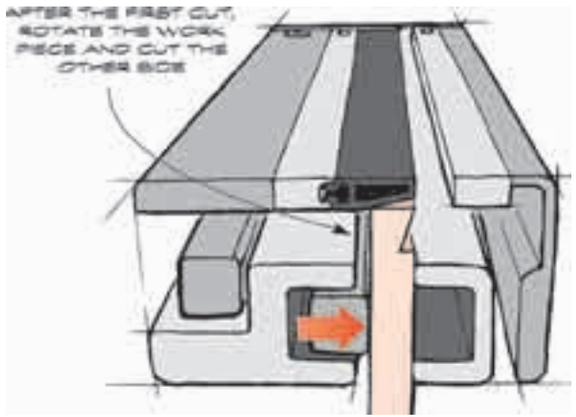


6.1 Advanced Joinery *(Continued)*

Asymmetrical Dovetail Layouts

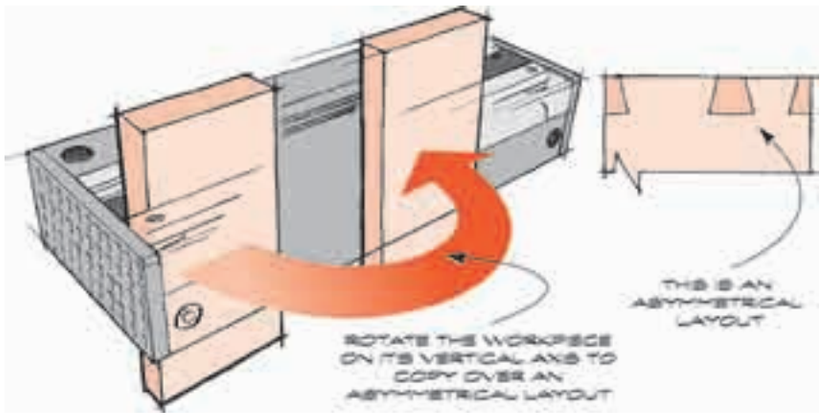
Provided a guide finger layout is symmetrical about the centerline of the work piece, you can use the same layout at both ends of a work piece (for example, both ends of a drawer front).

An asymmetrical joint layout is one that is not symmetrical about the centerline of the work piece. In this case you will likely need L.H. and R.H. joints, for example, if the work piece is a drawer front. You will need to copy over a mirror image layout to the opposite end of the jig, then cut the L.H. joints at say, the L.H. end of the jig and the R.H. joints at the R.H. end of the jig.



You can copy over joint layouts by measurement, but there is an easier way. Temporarily clamp a previously cut work piece in the far end of the jig and line up the guide fingers with the joint elements.

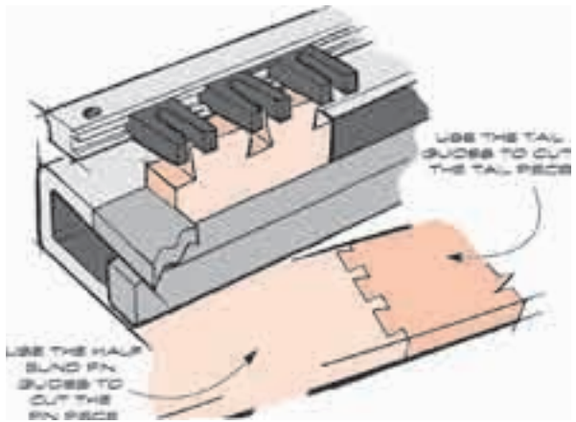
You can do this by sliding the previously cut work piece straight to the opposite end of the jig for symmetrical layouts, or by turning it around for asymmetrical layouts to create a mirror image.



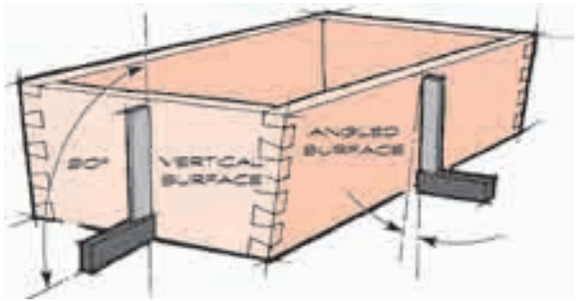
End-On-End Dovetails

End-on-end dovetails work on the same principal as half blind dovetails. The only difference is that both work pieces are clamped one at a time, vertically against the rear channel. Fit is controlled by cutter depth.

End-on-end dovetails offer a decorative way to join short boards together to make longer boards. They're also a fast way to cut test pieces for conventional half blind dovetails.



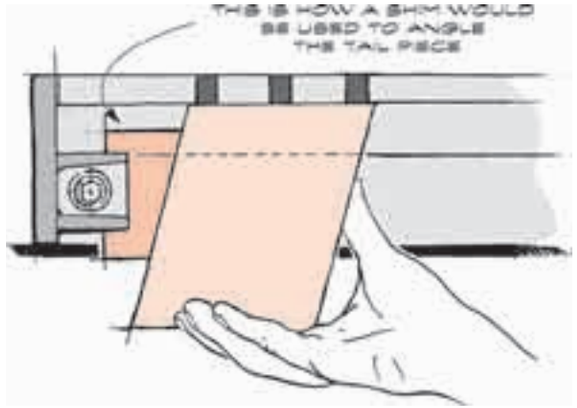
Angled Dovetails



You can make an interesting variation of the standard dovetail by angling one work piece.

The wooden box shown above is shaped like a typical planter with the two ends vertical and the two long sides angled outward from the base. At the corner joint one piece is vertical and the other is angled outwards. Therefore, only one of the boards that forms the joint will be mounted in the jig at an angle. The other board must be mounted square.

Make up angled and straight-sided shims as required to ensure accurate positioning and repeatability. Make them thinner than your work piece. Shape the angled fences installed in the vertical clamping system so they're trapped and located vertically for accurate reference. Do the same for the horizontal fences.



Caution – too great an angle will create short grain. Cut test pieces first.

6.2 Advanced Tips

Here are a few more hints and tips in addition to those scattered throughout this manual. AKEDA welcomes your input, and would like to hear from you if you find new ways to exploit the innovative features of the AKEDA jig.

How To Vary Pin Width

The guide fingers normally cut 1/2" x 1/4" pins, meaning they are approximately 1/2" wide at the widest point, and approximately 1/4" wide at the narrowest point. However, you can cut pins that are wider by 1/8" increments. Try a test joint first.

For example, to form a 5/8" x 3/8" pin, simply rout along the L.H. side of the pin guide, move the pin guide to the right one increment, then rout along the R.H. side of the pin guide. Make two corresponding pencil marks on the guide rail. Install the tail guide on one pencil mark, then on the other to cut a matching pin socket.

You can also create very slender 3/8" x 1/8"pins by moving the pin guide closer to the first cut by one increment. However, in this case you will have to cut the pin sockets by hand because the pin profile is smaller than the dovetail cutter profile.

Half Pins

Most dovetail joints begin and end with a half pin, not a half tail. Half pins should be a little wider than one half of a full pin for reasons of strength and appearance. Position the first and last guide fingers (which form the half pins), one or two increments (1/8" or 1/4") in from the edge of the work piece.

A Common Problem With Joint Fit

Check the joint elements immediately after machining, before removing the work piece. Run your finger across all the surfaces to feel for bumps where the guide bushing may have momentarily lost contact with the guide finger or guide rail. Re-machine if necessary.

Joint Layout

You'll find the jig easier to use if you cut all your work pieces in 1/8" increments. Sometimes, the number of increments won't divide up the way you want them, or you may not be able to find a central pin position when you have an odd number of pins. No problem. Simply try different layouts, and add or remove pins until you achieve an attractive layout. You can make one pin thicker by 1/8". Or make an asymmetrical layout. Or you can get creative and group the pins in pairs. Or make one half pin thicker than the other, and plane it off afterwards.

Clamping

Avoid over clamping and never leave the clamping system under pressure. It is not necessary to apply more than 4 or 5 ft. lbs. of torque to clamp a work piece. Using the AKEDA knob, the average person can generate 4 to 6 ft. lbs. with one hand, and 6 to 8 ft. lbs. with two hands. Applying 8 ft. lbs. of torque will damage a softwood work piece. Try clamping a waste piece progressively tighter until it won't move, and remember the amount of torque to apply next time.

Never use a wrench in place of the clamp knob. Damage will result if the torque exceeds 16 ft. lbs.

Remove the clamp knob before routing.

Joints That Fit Too Tight

Smaller joints should fit together with heavy finger pressure, larger joints with light impact. If a joint is too tight, consider the following:

You can force an excessively tight joint together by crushing the fibers, but you risk splitting off a half pin, especially if the wood has weak grain. Also, if a joint is too tight, adhesive will be squeezed out during final assembly, weakening the bond. Caution - a softwood joint will become looser after it's been assembled and pulled apart a few times.

When assembling a joint or pulling it apart, don't "wiggle" it. Keep both work pieces straight and parallel.

How To Duplicate Joint Layouts

You can create identical guide finger layouts at the opposite end of the jig, or on a separate jig by using a previously cut work piece as a template.

If you need to create a mirror image of an asymmetrical joint layout, turn the previously cut work piece 180º on its vertical axis before clamping it and using it as a template.

How To Cut Joints With Different Width Work Pieces

Sometimes a pin piece is a different width to the mating tail-piece. If one edge of the joint is flush, then reference these edges against the side fence. If neither edge is flush, you will need to shim one work piece. Alternatively, cut all the tail pieces first, then copy the whole guide finger layout over to the left or right by an amount equal to the difference in width, then cut all the pins without the need for a shim.

How To Reduce Tear Out

Dull cutters, weak grain, incorrect cutter speed, and excessive feed rate are the main contributors to the "tear-out" experienced with routers. Cutter feed rate is learned by feel, and by trial and error. If you have a variable speed router, set the RPM to between 18,000 and 24,000 for best results. But you will still experience tear out with some varieties of wood.

The best way to reduce "tear-out" at the back of vertically clamped work pieces is to install a waste "back-up board" in the horizontal clamp, snug up against the back of the work piece. It can be reused on the same joint layout many times. You can also use a horizontally clamped "back-up board" to minimize vibration when routing thinner work pieces. You can also mount a board vertically in front of through dovetail work pieces, and behind half blind tail pieces. The rule is, the back-up board must always contact the clamp tube, not a channel, and the combined back-up board and work piece cannot exceed the clamping capacity of the jig.

Practicing the right routing technique will also help. To get better results, make the first cut very lightly from right to left. Take roughing cuts without breaking through the back of the sockets. Keep the guide bushing slightly away from the guide surfaces. Reduce the feed rate before breaking carefully through the backs of the sockets. Finally, make a fine finishing cut with light pressure against the guide surfaces.

There is another way to reduce tear-out. The instructions in this manual recommend "up-cutting" because it is safer for novices. As you gain experience with routing, you can try "down-cutting". To do this on, say, a through dovetail pin piece, make the first cut lightly from right to left, and then remove most of the tail socket material by routing from left to right. Then break through to the back of the socket on the left side, and rout across the back of the socket from left to right. Be very careful when down cutting. Grip the router very firmly, and take light cuts, because the cutter may bite into the wood. A heavier router helps.

If a through dovetail joint layout is exactly symmetrical, and you are working accurately, you can mount the tail piece with the outside surface of the drawer towards you instead of away from you, so most of the "tear-out" will be on the inside of your project. An asymmetrical tailpiece can also be routed backwards by creating a mirror image layout at the opposite end of the jig.

How To Improve Productivity

Some suggestions for improving productivity:

If you have several joints to cut, cut all the tailpieces first, then cut all the pin pieces.

Two through dovetail tail pieces 1/2" thick or less can be cut at the same time.

Prepare a piece of close grained hardwood. Install it in the horizontal clamp and rout across it when you've determined the correct half blind cutter depth for a particular cutter. Mark the cutter sizes on it and keep it as a cutter depth gauge.

If your work piece width is less than half the width capacity of the jig, use a previously cut pin piece to copy the guide finger layout over to the opposite end of the jig to create an identical tail layout. This will save having to change guide fingers. But more important, in the case of half blind dovetails that are less than half the width capacity of the jig, it will allow you to cut the pin piece and the tail piece in a single pass, using both clamping systems and two guide finger layouts.

If your work piece width is greater than half the width capacity of the jig, identical pin and tail layouts can be set up on separate jigs.

If you cut the same joint frequently, consider dedicating a router or two to the jig.

If you cut a variety of different joint layouts frequently, consider keeping additional guide rails permanently set up with frequently used guide finger layouts.

Past joint layouts are easily restored if you keep a labeled joint sample as a permanent template.

Use the tail guide spacers when training an apprentice and use the half blind pin stops to speed up half blind pin piece positioning. Both are available in the Accessory Kit.

Other Uses For The Jig

Use either clamping system as a horizontal or vertical vise for other operations.

Mount your own templates in place of the guide rails. Use 9/16" material for your templates.

Use both clamping systems to hold two work pieces at right angles for accurate alignments, such as dowel drilling.

6.3 Useful Accessories

Comprehensive Kits

1. 64 Pce. Accessory C-KIT (3300)

This Kit includes the Dust Collection Kit (item 2) and the Cutter Set (item 3). It also contains ten 9º TD pin guides, ten 11º guides, ten 14º guides, and ten 20º guides.

This kit also includes:

A Power Cord Wand that mounts on the jig to keep the router's power cord out of your way while you're routing; a sliding dovetail template that can also be cut to form tail guide spacers that fit between the tail guides to prevent accidentally routing between them; standard, oversize and undersize guide bushings; and a 1/2" to 8 mm collet reducer.

2. Dust Collection Kit (3100)

The AKEDA Dust Collection Kit includes a nozzle that snaps onto the jig, a pair of adapters to connect to your shop hose, and a seal to close off the jig's plenum chamber. The dust collection system will remove up to 95% of the heavy waste and fine airborne dust particles.

3. 7 Pce. Bit Set (3800)

The Cutter Set is a plastic case containing all five dovetail cutters - 7º (3807), 9º (3809), 11º (3811), 14º (3814) and 20º (3820). The set also contains one standard .315" straight bit (3880), and one .350" box joint bit (3858). All cutters have 8mm shanks.

Individual Accessories

4. Through Dovetail Pin Guides

The 7º (3207), 9º (3209), 11º (3211), 14º (3214) and 20º (3220) pin guides are all available in sets of five. They match the cutter angles to provide a full range of through dovetail joints in depths from 1/4" up to 3/4".

5. Half Blind Dovetail Pin Guides (3230)

Available in sets of five.

6. Universal Tail Guides (3240)

Available in sets of five.

7. Dovetail Cutters

The five matching angled dovetail cutters are available individually - 7º (3807), 9º (3809), 11º (3811), 14º (3814) and 20º (3820).

8. Straight Cutters

The standard 315" (3880) straight bit is available individually.

9. Box Joint Cutter

This .350" x 1" box joint straight cutter (3858) enables you to cut a variety of box joints using the half blind guide fingers.

10. Tail Guide Spacer Extrusion (3467)

This extrusion can be cut up with a hand saw and used as tail guide spacers.

11. BC/DC User Manual (3450)

12. Half Blind Pin Stops (3250)

HBD Pin Stops are used to control the distance that the half blind pin piece projects beyond the rear guide rail.

13. Thin Wall Precision Guide Bushings

The standard 7/16" or .438" (3520) guide bushing, the .004" oversize .442" (3521) guide bushing and the .004" undersize .434" (3522) guide bushing allow you to control through dovetail joint fit. Available individually.

14. Clamp Knob (3401)

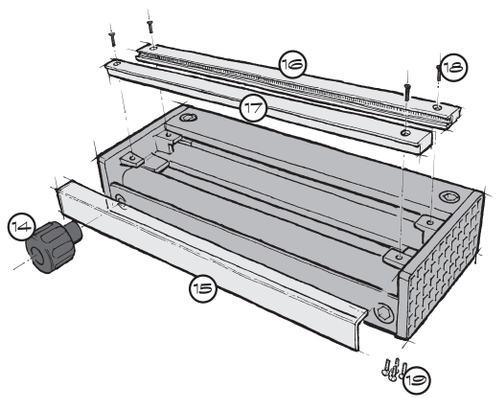
15. Window, 16” (3216), 24” (3224)

16. Ribbed Rear Guide Rail Assembly, 16” (3417), 24” (3424)

17. Ribbed Front Guide Rail, 16” (3418), 24” (3419)

18. M5 x 20 Flathead Phillips (Guide Rail) Screws

19. M6 X 30 Flathead Phillips (Mounting) Screws



20. Collet Reducer

The 1/2" to 8mm collet reducer (3447) is used to fit AKEDA's 8mm shank router bits to routers with a 1/2" collet.

Making Tail Guide Spacers

Tail guide spacers are used to prevent routing between pin sockets.

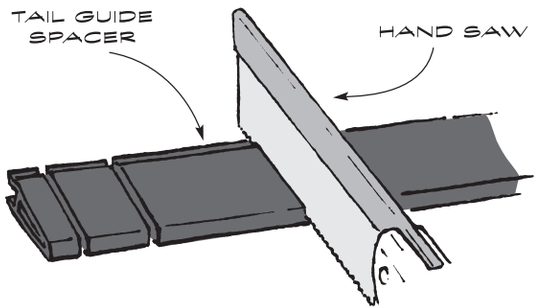
Preparation:

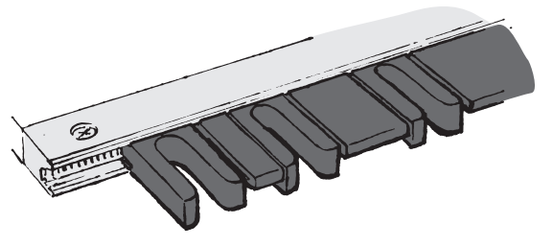
Cut the sliding dovetail template extrusion into short lengths with a fine tooth handsaw, as required.

Application:

1. The gap between the tail guide and the tail guide spacer must be less than the guide bushing diameter, say, 1/4” or less.
2. Hold the tail guide spacer above the jig, angled side down, and snap down into the guide rail. Make sure it is flush with the top surface of the guide fingers.

Note: You can also use a section of extrusion to close off the unused portion of the jig to increase the air flow through the rest of the jig when you are using dust collection.

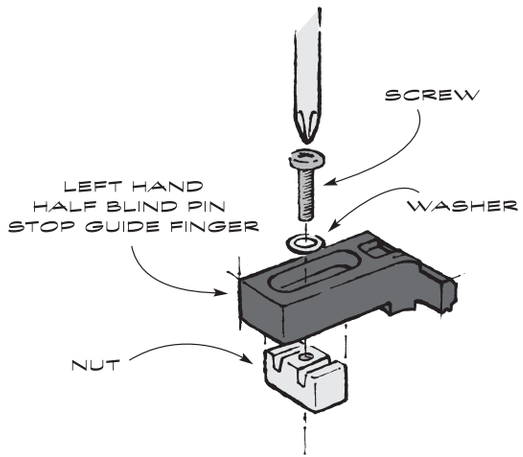




6.3 Useful Accessories *(Continued)*

Using the Half Blind Pin Stops

The half blind pin stops are used to replace the standard half blind pin guide at each end of your layout. They are supplied as a LH and RH pair. Assemble as shown.

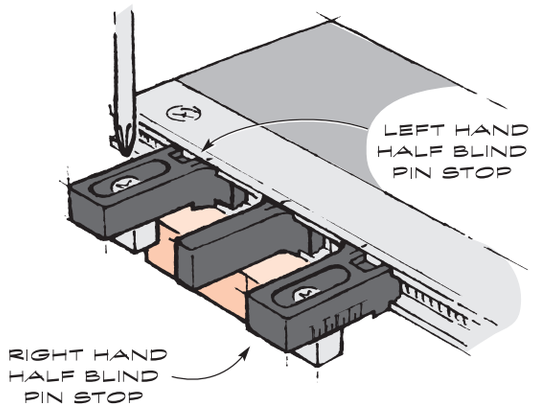


Half blind pin stops can be used on a plain or rabbeted drawer front. The rabbet must be at least 1/4" deep.

Reposition the nuts every time you change the thickness of your half blind tail piece (drawer side).

Application

1. Hold the half blind pin stops below the guide rail, screw heads up. Align them with your pencil marks, and snap them up into the guide rail. Carefully loosen the screws and slide the nuts fully towards you.
2. Install your half blind pin piece so it projects from the guide rail by an amount equal to the thickness of your half blind tail piece. Use your tail piece as a gauge.
3. Slide the nuts up against the half blind pin piece and tighten the screws. The next time you install a half blind pin piece, simply slide it forward until it touches the nuts at both ends, and tighten the clamp knob.



BC/DC Version 1.3